SKEPTICAL INQUIRER

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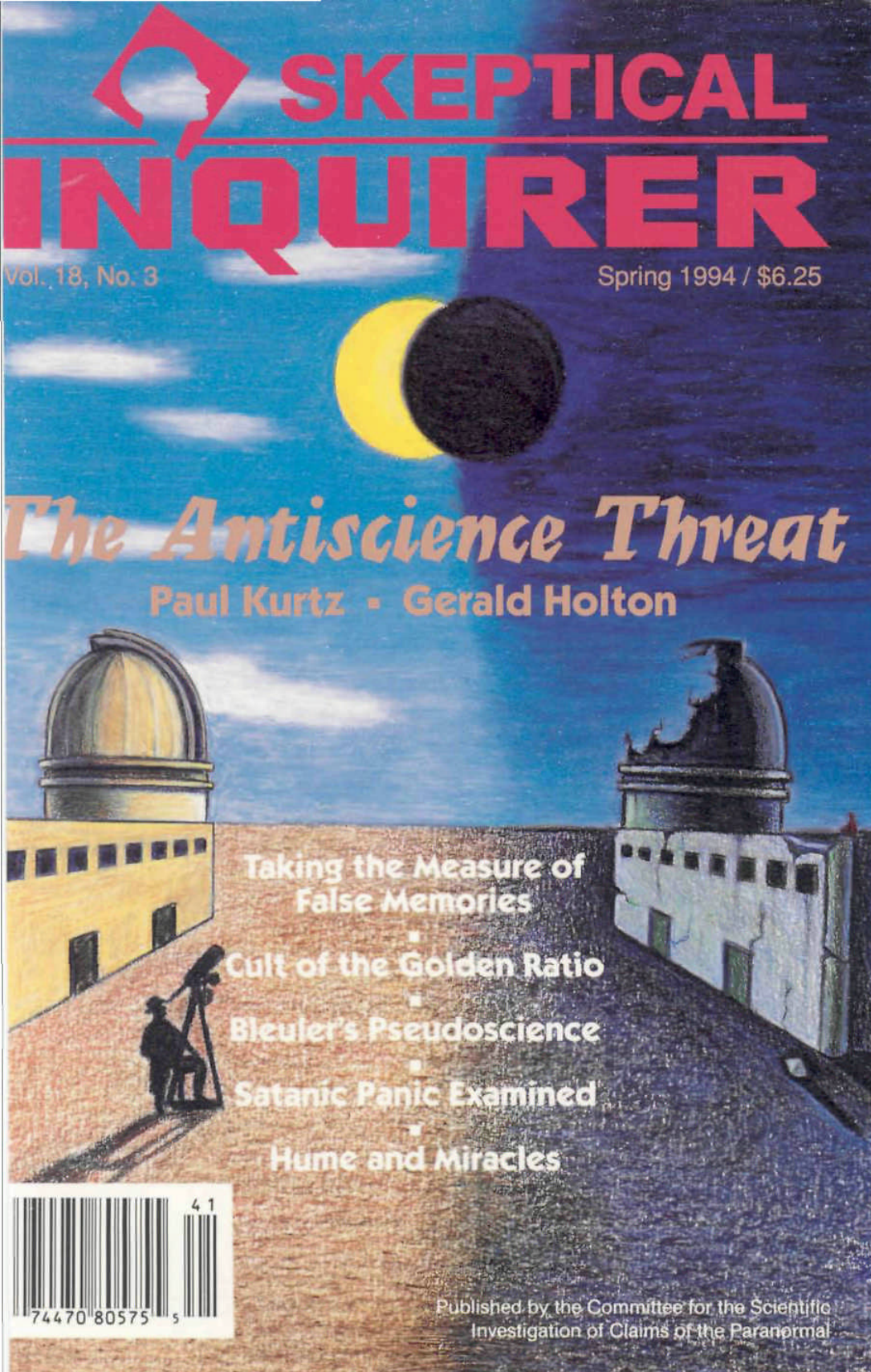

The Antiscience Threat

Paul Kurtz • Gerald Holton

Taking the Measure of False Memories

Cult of the Golden Ratio

Bleuler's Pseudoscience

Satanic Panic Examined

Hume and Miracles

41

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THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal, an international organization.

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SKEPTICAL INQUIRER

Vol. 18, No. 3, Spring 1994

Journal of the Committee for the Scientific Investigation of Claims of the Paranormal

THE ANTISCIENCE THREAT

The Growth of Antiscience — *Paul Kurtz* — **255**
The Antiscience Problem — *Gerald Holton* — **264**

ARTICLES

Measuring the Prevalence of False Memories — *Ted G. Goertzel* — **266**
Bleuler's Views on Inheritance of Acquired Characteristics and on Psi Phenomena — *George Windholz* — **273**
Examining the Satanic Panic . . .
. . . A Personal Perspective on 'Satanism' — *Peter Huston* — **280**
. . . A Sociological and Historical Perspective — *Terence M. Hines* — **281**
Philosophy and the Paranormal, Part 2: Skepticism Miracles, and Knowledge — *William Grey* — **288**

NEWS AND COMMENT — **229**

GAO to Investigate 1947 'Saucer Crash' / Benveniste Unredeemed by Replication Experiment / Oklahoma 'Psychic' Frustrates Police / University Cautions on Therapeutic Touch / 'Psychics' Fail Again / TMers Lose in Canada / Sagan Receives NAS Award / Ig Noble Awards

RESEARCH REVIEW

Studying the Psychology of the UFO Experience — *Robert A. Baker* — **239**

NOTES OF A FRINGE-WATCHER

The Cult of the Golden Ratio — *Martin Gardner* — **243**

PSYCHIC VIBRATIONS

It's All a Conspiracy, and It's Invisible — *Robert Sheaffer* — **250**

BOOK REVIEWS

Deborah Lipstadt, *Denying the Holocaust* — *Terence M. Hines* — **295**
Gary Taubes, *Bad Science* — *Terence M. Hines* — **296**
Joe Nickell, *Looking for a Miracle* — *Robert A. Baker* — **298**
Jenny Randles and Peter Hough, *Spontaneous Human Combustion* — *Gordon Stein* — **300**
Stuart Gordon, *The Paranormal: An Illustrated Encyclopedia* — *Gordon Stein* — **302**

NEW BOOKS — **305**

ARTICLES OF NOTE — **307**

FOLLOW-UP — **314**

"The Impossible Box" and the "Oregon Vortex Illusion"

LETTERS TO THE EDITOR — **319**

GUIDE FOR AUTHORS — **333**

ON THE COVER: Illustration by Bruce Adams.

The Committee for the Scientific Investigation
of Claims of the Paranormal
announces the

1994 CSICOP Conference

at the **Doubletree Suites Hotel**

Seattle

Thursday through Sunday
June 23-26, 1994

THE PSYCHOLOGY OF BELIEF

Keynote Address
(Friday at 8:00 P.M.)

Carl Sagan

Thursday, June 23

7:30 - 10:00 P.M.: ALIEN ABDUCTIONS

Moderator: **Paul Kurtz,** CSICOP Chairman
Robert Baker, professor emeritus of psychology, University of Kentucky
Thomas Bullard, folklorist, Indiana University, Bloomington
John Mack, professor of psychiatry, Harvard University
Nicholas P. Spanos, professor and director of the Laboratory of Experimental Hypnosis, Carleton University, Ottawa

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Friday, June 24

7:30 - 9:00 A.M.: Registration

9:00 A.M. - 12:00 NOON: THE BELIEF ENGINE: HOW WORLD VIEWS ARE FORMED

Moderator and Panelist: **James Alcock,** professor of psychology, Glendon College, York University, Toronto
Ray Hyman, professor of psychology, University of Oregon, Eugene
Andrew Neher, professor of psychology, Cabrillo College, Aptos, California
Anthony Pratkanis, professor of psychology, University of California, Santa Cruz

12:45 P.M. - 2:15 P.M.: Luncheon (OPTIONAL)
An Illustrated History of UFOs
James McGaha, Major, USAF (Retired)

Friday (continued)

2:30 - 5:30 P.M.: HOW WE FOOL OURSELVES: ANOMALIES OF PERCEPTION AND INTERPRETATION

Moderator and Panelist: **Barry Beyerstein,** professor of psychology, Simon Fraser University, Vancouver, B.C.

Irving Biederman, professor of psychology, University of Southern California

Elizabeth Loftus, professor of psychology, University of Washington, Seattle

Other speakers to be announced.

8:00 P.M.: KEYNOTE ADDRESS

Carl Sagan, David Duncan Professor of Astronomy and Space Science, Cornell University

Saturday, June 25

8:00 - 9:00 A.M.: Registration

9:00 A.M. - 12 NOON: MEMORY: HOW RELIABLE IS IT?

Moderator: **Carol Tavris,** psychologist, author, Los Angeles

Stephen Ceci, professor of psychology, Cornell University

Richard Ofshe, professor of sociology, University of California, Berkeley

Loren Pankratz, clinical psychologist, Portland, Oregon, Veterans Administration

12 NOON - 2:00 P.M.: CSICOP Luncheon (OPTIONAL)

Brenton VerPloeg, attorney, Schults & Bowen, **CSICOP and the Law**

Special Remarks: **Kendrick Frazier,** Editor of the *Skeptical Inquirer*
Joe Nickell, CSICOP Executive Council

2:00 - 5:00 P.M.: INFLUENCING BELIEFS IN THE COURTROOM: RULES OF LAW, EXPERT TESTIMONY, AND SCIENCE

Moderator and Panelist: **Gerald M. Rosen,** clinical associate professor, Departments of Psychiatry and Psychology, University of Washington, Seattle: **"Confirmatory Bias in Forensic Settings"**

Barry Beyerstein, Brain Behavior Laboratory, Psychology Department, Simon Fraser University, Vancouver, B.C.: **"Graphology: Pseudoscience in the Courtroom"**

Peter Huber, author of *Galileo's Revenge: Junk Science in the Courtroom*

Timothy Moore, associate professor of psychology, Glendon College, York University, Toronto: **Scientific Consensus and Expert Testimony: Lessons from the Judas Priest Trial**

6:00 - 7:00 P.M.: Pre-Banquet Social Hour (cash bar)

7:00 - 10:00 P.M.: Awards Banquet (OPTIONAL)

Host: **Paul Kurtz,** CSICOP Chairman
Carl Sagan, Cornell University
John Maddox, editor, *Nature* magazine
Elizabeth Loftus, University of Washington

(Continued on next page.)

Sunday, June 26

9:00 A.M. - 12 NOON: CONSPIRACY THEORIES

Moderator: **Lee Nisbet,** professor of philosophy, Medaille College, Buffalo, N.Y.

Don Kates, attorney and criminologist, San Francisco.

Phil Klass, former senior editor, *Aviation Week and Space Technology* magazine:
"UFOs: Government Cover-Ups?"

Valerie Klein, JFK assassination researcher

Conference Information

Accommodations: Doubletree Suites Hotel (206-575-8220) **Single/double $79** (includes complimentary full breakfast buffet). Mention CSICOP Conference for this special rate. Cut-off date for conference rate is June 8. All suites have livingroom, bedroom, and bath; two telephones and two televisions.

Or stay at the Doubletree Inn (206-575-8220), directly across the street. **Single/double $65.**

Complimentary shuttle service to and from Sea-Tac Airport to Doubletree Suites or Doubletree Inn; 15 minutes from downtown.

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Media representatives should contact Barry Karr at 716-636-1425.

This conference is hosted by the Society for Sensible Explanations, an independent, autonomous skeptics' organization in Seattle.

Opinions expressed at CSICOP conferences are those of the individual speakers and do not necessarily represent the views of CSICOP.

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Preregistration is advised. (Students 25 or under $25.00. Send photocopy of student I.D.) Registration fee does not include meals or accommodations. Make checks payable to CSICOP and return to:

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News and Comment

E.T., Phone the GAO: Roswell Incident Gets Congressional Ear

So now the government will investigate the government regarding the so-called Roswell incident. It should be interesting to see the eventual outcome of the General Accounting Office study, requested by Congressman Steve Schiff, a New Mexico Republican, into the facts surrounding an alleged crash of a flying saucer northwest of Roswell, New Mexico, in 1947. (There is good evidence that the debris found was that of a radar corner reflector and the balloon that had been carrying it. For *SI*'s critical examination of these claims, see Philip J. Klass's four investigative articles, Spring 1986, Winter 1987-88, Spring 1988, and Winter 1990.)

Klass's *Skeptics UFO Newsletter* and the *Albuquerque Journal* revealed in January that Schiff had requested the GAO investigation. Schiff, whose district includes Albuquerque but not Roswell or the alleged crash site, said he requested the study after receiving several letters from constituents asking about an alleged cover-up and then getting the runaround from the Pentagon. He told reporters he doesn't really believe the study will discover that alien bodies were found and spirited away back in 1947, but he does think there was a government cover-up of some kind about something that happened then and that it should be revealed. He denied that he was influenced in any way by Karl Pflock, the husband of a senior Schiff aide, Mary Martinek. Pflock has long been interested in UFOs and spent a year investigating the Roswell incident.

The initial news coverage, surprisingly, treated the matter straight and seriously. Schiff clearly intends this to be considered a serious public issue, worthy of a taxpayer-funded GAO study. (The *Washington Post* asked the GAO what the study would cost; ironically, the GAO said it doesn't reveal such information.) At one time, it might have appeared politically risky for a Congressman to call for a UFO investigation, but clearly the rules have changed. What once would have appeared merely silly and frivolous to the public now gets a respectful hearing in a society seemingly unable to establish priorities of any sort over what's important and what's not.

It is hard to believe the study will be able to reveal any new facts or important government secrets. If it does, all to the good. More likely, the findings will be equivocal and leave the door still open to all the speculations of UFO buffs and conspiracy theorists, whose legions in recent years have seemingly multiplied. Will an absence of any revelatory documents be taken as "evidence" of a further cover-up? We'll have to see.

—*Kendrick Frazier*

Scientists Repeat Dilution Experiments, Find No Support for Benveniste

Scientists in Britain report that they have been unsuccessful in an attempt to reproduce the dramatic findings reported by Jacques Benveniste and coworkers in 1988 involving so-called "remembering water." Benveniste, Elizabeth Davenas, and colleagues had reported in a much-contested *Nature* paper that an antiserum solution when diluted to such a high degree that no molecule of the antiserum could be expected to remain nevertheless displayed a measurable biological effect. Homeopathic practitioners hailed the result as confirmation of their claims.

The result raised a storm of controversy. The laboratory techniques were widely challenged, and *Nature* editor John Maddox even led an investigative visit to the Benveniste lab—agreed to as a condition of *Nature*'s publication of the paper—where he, NIH science sleuth Walter Stewart, and magician-investigator James Randi found and later reported serious flaws in experimental protocols.

Now S. J. Hirst, N. A. Hayes, J. Burridge, F. L. Pearce, and J. C. Foreman, from the departments of pharmacology, statistical science, and chemistry at University College London, report the results of an experiment attempting to reproduce the original findings. The researchers followed as closely as possible the methods of the original study. They carried out experiments on sample antiserum solutions that they had diluted anywhere from 10^2 (100 times) to 10^{60}. In each experimental session they implemented separate controls of a type that were missing from the original experiment. In the minimal 100× dilution some degranulation biological activity remained, as would be expected, but dilutions ranging from 10^{12} to 10^{60} failed to cause degranulations. (Benveniste and colleagues had claimed they obtained degranulations at dilutions as great as 10^{120}.)

Hirst et al. report in the December 6, 1993, *Nature* (366:525) that they found no evidence for any biological effect in the very dilute solutions. They found nothing to lend any support to the findings of Davenas et al. "We have been unable to find any evidence that very high dilutions of anti-IgE, successed or unsuccessed [shaken or unshaken], cause any reproducible effects on the degranulation of human basophil leukocytes," they report. "No aspect of the data is consistent with the previously published claims."

Nature published the paper without comment.

—*K. Frazier*

Oklahoma Psychic Fails to Find Missing Bodies

In a rural area of Oklahoma, just outside of Tulsa, a local "psychic" recently led authorities to an area pond in an attempt to locate the bodies of Terri Schlatter and her son Nathan, who had been missing since 1985. Initially the psychic, identified only as A. Louise of Oklahoma City, was contacted by a family friend of a September 1992 murder victim, Erika Hartwick, in hopes of gaining more information about what caused Hartwick's death. (It is important to note that the incarcerated prime suspect in the Hartwick death, Darrell Schlatter,

was the husband of Terri Schlatter and was long thought to be involved with the 1985 disappearance of his wife and son.)

In the process of A. Louise's "investigation" into the 1992 murder, the psychic reported picking up "images about a woman and child in a pond" that seemed to relate to the 1985 case. A sister of the missing Terri Schlatter, impressed with the psychic's apparent talent and abilities, urged Deputy U.S. Marshal James Caldwell to contact the psychic. Though skeptical, Caldwell spoke with A. Louise several times, and eventually in May 1993 he arranged for her to visit several different locations around the Tulsa area. During her search, A. Louise repeated claims that she was picking up "strong vibrations" and the images of two bodies, a pond, and thick mud. Claiming at one point to have made contact with Terri Schlatter's spirit, the psychic said, "I started picturing Terri and her child, the images of them being weighted down. I could actually sense her being thrown in. It was kind of like a dream, very vague, no color." A. Louise then claimed Terri's spirit indicated that her burial place was at the bottom of a large pond located close to a former home of the Schlatters.

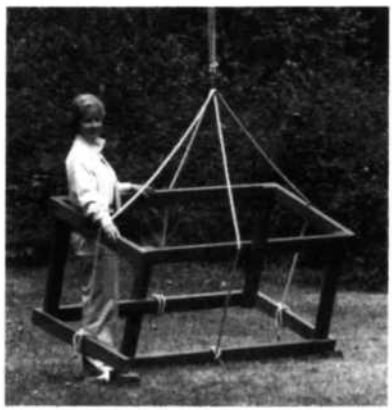
Unsure how to proceed, the investigators requested help from Search and Rescue Dogs of Oklahoma, which trains dogs to locate buried human cadavers. The dogs were brought out separately, and two of them were said to have "alerted" within 10 feet of the location indicated by the psychic and a third hit directly downwind from the spot. With this evidence, the investigators decided to proceed with the draining of the pond. Lending further credibility to the psychic was word that the suspect, Darrell Schlatter, committed suicide in his jail cell after learning that the pond was being searched. (The correlation however was later discounted.)

After the water was drained in June, diggers had to wait for the remaining mud to dry. By July, investigators dug by hand and soon after began to use heavy equipment, although it, too, failed to locate any bodies. Dogs were again brought in, but this time were unable to pick up any scent. (Trainers blamed the dogs' failure on the hardened mud, which they claim can block decomposition gases from being released.)

Commenting on the slow progress of the search, one investigator remarked: "Obviously, this has to be concluded at some point. We can't dig to China." After weeks of digging, no bodies were found and the search was abandoned.

—*Tom Genoni, Jr.*

But That's Impossible!



Was this your reaction when you saw this photo published in the Winter 1993 SKEPTICAL INQUIRER? Did you want to know how it was done? Did you wonder how the "vortex plank" illusion photos in the same article were achieved? If so, you'll want to turn to our Follow-up column in this issue, page 314. If not, you should avoid that section altogether.

University of Colorado Report Critical of Therapeutic Touch

When the Rocky Mountain Skeptics (RMS) first approached the Colorado Board of Nursing (CBN) on January 30, 1992 (*SI*, Winter 1993, pp. 172-173), the concern was simple: "How can Board-recognized credentializing organizations be made responsible and accountable for the content of continuing education claims?" The Board's response was to convene the Task Force to Colorado State Board of Nursing Regarding Therapeutic Touch on April 8, 1992, at the University of Colorado's Health Science Center. In its letter to RMS of June 8, 1992, CBN wrote in part that "the Board voted to reaffirm its previous determination that therapeutic touch was an acceptable study area for continuing education credit." The Rocky Mountain Skeptics became curious about CBN's identifying TT to the exclusion of other courses.

One year later, having investigated the claims and the evidence for TT, the Rocky Mountain Skeptics approached CBN with their findings. (See *SI*, Spring 1993, pp. 327-330.) After a two-hour discussion the Board moved to reaffirm its previous vote to continue to accept TT for credit. In a letter dated February 10, 1993, CBN offered the following defense: "The treatment must be performed in order to measure its effect. For the treatment to be performed, persons must learn how to perform the treatment. Accordingly, the Board approved of therapeutic touch as acceptable content for continuing education. It also noted that the subject must be studied by the researcher before the research can begin."

On April 29, 1993, the Colorado Senate's Health, Environment, Welfare and Institutions Committee (HEWI) held a hearing to directly address the RMS's concern about CBN's decisions with regard to alternative healing practices. The Chair of HEWI wrote to CBN May 7, 1993, that the HEWI "Committee members are concerned that the continuing education courses on non-traditional healing practices being approved by the Colorado Board of Nursing are not receiving sufficient review. . . . The Senate HEWI Committee expects board members to thoroughly review alternative healing practices, such as therapeutic touch, neurolinguistic programming, and crystal healing, prior to approving the study of these healing methods for continuing education."

Meanwhile RMS began an investigation of the promotion of TT at the University of Colorado's Health Science Center (UCHSC). The Center for Human Caring (CHC), under the leadership of Jean Watson, then dean of the School of Nursing at CU, had been organized in 1986 within UCHSC. CHC's original mission statement included five points, one of which was: "the development of a theory of flexible health care relating to the importance of human responses with scientific and technological aspects of such care." In 1989 the mission statement was revised and the centrality of scientific and technological aspects eliminated, to be replaced with: "to develop and disseminate educational, research and clinical strategies to reestablish the critical balance between techno-care and human-care within the health care system. To restore the centrality of the arts and humanities in understanding the subjective human dimen-

sions of nursing, health, illness and healing and in designing new strategies for caring and healing."

RMS became concerned about CHC's aggressive promotion and advocacy of TT: specifically, its influence over the School of Nursing in the form of several Ph.D. theses (e.g., "A Phenomenological Inquiry on the Child's Lived Experience of Perceiving the Human Energy Field Using Therapeutic Touch"), graduate level courses for credit, and a colorful four-page flyer promoting a three-part video series "Therapeutic Touch: Healing through Human Energy Fields" available for $675 and produced by Janet Quinn, a senior scholar at CHC.

RMS presented its concerns to several University of Colorado Regents, who then requested an investigation by the chancellor of UCHSC. The chancellor instructed the Academic Relevance Review committee to evaluate CHC and present its findings and recommendations to the Regents. Throughout the review process RMS wrote frequently to the chancellor and met with him. On December 16, 1993, the report was issued. The seven-page document, while praising CHC in some areas, was highly critical in others and confirmed much of RMS's suspicions. Regarding RMS's concerns, the committee's report said:

> The Center Directors should realize that they do themselves, their concepts and the School harm by the use of jargon that cannot clearly be understood, and by the espousal of theoretical constructs which appear devoid of proof. Course titles such as Emerging Otologies, Developing Resources of the Inner Self-in-Context, and Existential Advocacy: An Ethic of Embodiment, do not encourage widespread appeal or understanding. The criticism of Therapeutic Touch has cast suspicion over the entire Center. If it is good therapy, it should be validated and encouraged. If not, it should be terminated. The sense of our Committee is that the scientific basis for Therapeutic Touch has not been validated and that efforts at this Center to do so have been inadequate.
>
> Our Committee believes that the following should be done with regard to Therapeutic Touch: The Chancellor and the Dean of the School of Nursing should appoint a special committee of investigators to carefully read the very extensive literature on this subject, to view all the videos and relevant course material, and to witness actual demonstrations of this technique. It should solicit testimony from both critics and advocates. The members of the committee should be investigators well-versed in the scientific method and should come from several disciplines on the Health Sciences Center campus with the exception of the School of Nursing. . . . Rather than superficially review this most contentious area, we feel that it should be done once and for all in depth, and in a thorough scientific manner. . . . If Therapeutic Touch is not recognized as a bona-fide activity with academic relevance, then no further course work should be offered under the aegis of the University.
>
> Finally, if and when the administrative relationships of the Center are clarified, the Center mission more focused, a frequent review mechanism established, the role of Therapeutic Touch investigated, and jargon and mysticism eliminated from course work, then seed money for a variety of programs . . . might flow appropriately to the Center. Unless these issues are dealt with, the good ideas with which the Center started may be overlooked in a tide of mounting criticism of unorthodox and unproven or untestable viewpoints and hypotheses.

At the conclusion of the Regents' hearing, where the report above was received, Regent Jim Martin made the following on-the-record pronouncement: "I do think the Rocky Mountain Skeptics serve a useful purpose in monitoring this scientific accountability. I think it does keep the process open and people focused on what is scientific and what isn't."

—*Bela Scheiber*

Bela Scheiber is president of the Rocky Mountain Skeptics and a member of the CSICOP Executive Council.

Headlines That Didn't Happen: Psychics Blow It Again in 1993

BILL AND HILLARY CLINTON SEPARATE!

MADONNA ARRESTED FOR SKIING NAKED!

FERGIE POSES FOR PLAYBOY!

TOILET PAPER SHORTAGE LEADS TO RIOTS!

The headlines above are among those predicted for 1993 by some of the world's best-known psychics, who made their forecasts in supermarket tabloids like the *National Enquirer, The Globe,* and the *Weekly World News.* You didn't miss these headlines. The predictions never came true.

Gene Emery, a science writer at the *Providence Journal,* says the psychics scored as poorly in 1993 as they have each year since he began tracking such forecasts in the 1970s. "By saving these predictions for a year it's easy for anyone to discover for themselves whether psychics have real powers or not," said Emery. "And each year, the results convince me once again that people who consult self-proclaimed psychics are probably wasting their money."

The Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), publisher of the SKEPTICAL INQUIRER, distributed Emery's analyses to the news media at year-end. According to CSICOP, psychics don't appear to be improving upon their "hit rate" with the passage of time, and CSICOP has yet to find any convincing evidence that psychics possess the special abilities they claim to have.

According to the psychics, 1993 was supposed to be the year that:

- "Fergie" posed naked for *Playboy* (as predicted by John Monti in the *National Enquirer*)
- Dolly Parton's left breast exploded during a nationally televised special (Peter Meers, *Weekly World News*)
- Bill and Hillary Clinton split up (Barbara Donchess, *National Enquirer*)
- Peter Jennings, Tom Brokaw, and Dan Rather were all replaced by younger anchormen (Maria Graciette, *National Enquirer*)
- Injuries forced the NFL to switch to two-hand touch football, and a shortage of toilet paper led to riots (Joseph Klar, *Weekly World News*)
- Princess Diana gave birth to a boy fathered by a U.S. Senator, and Queen Elizabeth abdicated her throne to enter a convent (Countess Serena Sahak, *Weekly World News*)
- Phil Donahue became an ambassador (Mystic Meg, *The Globe*)
- Jay Leno was replaced on the Tonight Show by Kathie Lee Gif-

ford (Hevenly, *National Enquirer*)

- The Hubble space telescope discovered alien beings living on an asteroid (Shawn Robbins, *National Enquirer*)

Emery said that, "depending on the psychic you listened to, 1993 was supposed to be the year that Madonna was arrested in Utah for skiing naked, she revealed that she was Jim Nabors' love child, or she remarried Sean Penn and cleaned up her image to become 'the new Julie Andrews of the film world.' "

While some psychics predicted Mike Tyson's release from prison, psychic Peter Meers said it would be the year Tyson finds true love, in prison—an inmate identified as "Big Bubba."

Psychic Gerd Peters said that former Teamster boss Jimmy Hoffa would be found alive; on the other hand, Countess Serena Sabak predicted that Hoffa's skull would be found inside a shark.

"From what I saw, these psychics missed every major unexpected news story of 1993, including Michael Jordan's retirement, the Midwest flooding, the World Trade Center bombing, the Israel-PLO peace treaty, and the Lorena Bobbitt case," said Emery. "Instead," he continued, "we had psychics predicting that Michael Jackson would discover a drink that cures addiction to crack cocaine, or he would run a retreat for troubled children on a 300-acre compound in rural Nebraska."

After decades of looking, scientists have not found convincing evidence that self-proclaimed psychics really have the ability to see the future, find missing people, or help solve crimes. When psychics are tested under conditions that eliminate luck or fraud, they typically fail.

Some people argue that the forecasts in supermarket tabloids are so outrageous that nobody in their right mind would take them seriously, Emery said. "But if I told you that two cartoon characters named Beavis and Butthead would make national headlines, you would have been wrong to call me crazy." Emery said he is always looking for predictions from professional psychics who might be able to demonstrate real talent, as long as the forecasts deal with major unexpected events that are guaranteed to make the headlines.

Among the events the psychics have already forecast for 1994: an earthquake will turn Florida into an island, Michael Jackson will become an evangelist, and thousands will die in South Carolina when a teenager accidentally detonates a homemade nuclear bomb in his basement.

"I predict," said Emery, "that it won't happen." □

TMer's Beliefs Didn't Fly In Great White North

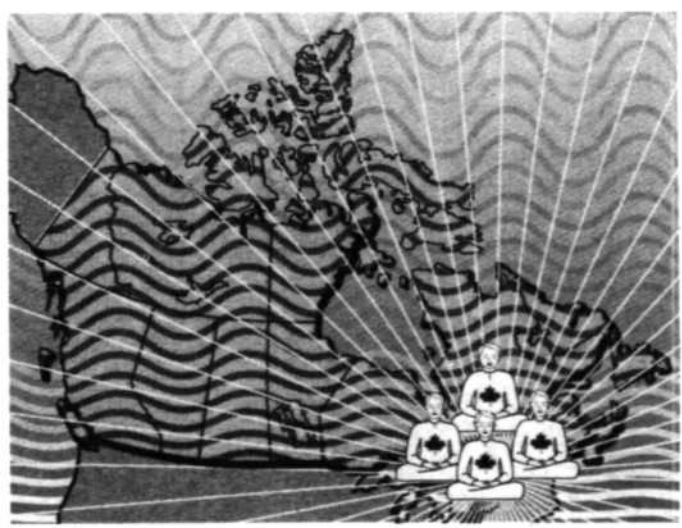
Regular readers of the SKEPTICAL INQUIRER may remember that the Natural Law Party, an organization based on the teachings of Marharishi Mahesh Yogi, recently made a presidential bid in the United States (*SI*, Winter 1993). Having failed in the U.S., the Transcendental Meditation group moved some of its operations up north and ran candidates in the Canadian federal elections of October 25, 1993.

In a promotional brochure featuring "extensive scientific research" to back the Natural Law Party's claims, party leader Neil Paterson called out to the citizens of Canada to join his cause so that "a perfect nation free from problems" could be established. Aside from the usual political rhetoric and promises of reduced crime, lower taxes, and a revitalized economy, the party also promised to meet some rather lofty goals. One of its more amazing plans for Canada was to create in Ottawa "A Group for a Government," which will consist of 10,000 Yogic Flyers, who by floating in the air will somehow "generate an indomitable influence of coherence, positivity, and harmony in Canadian national consciousness. This will prevent negative trends within society and protect the nation against destructive influences from beyond our borders."

As evidence of their ability to "prevent negative trends," the Natural Law Party claimed that last June and July a group of 4,000 Yogic Flyers in Washington, D.C., "created such a powerful positive influence that violent crime dropped—approximately 25 percent below predicted levels—and U.S. government performance improved dramatically." (Someone should tell District of Columbia mayor Sharon Dixon that she won't be needing the National Guard after all.)

Despite all of the wonderful promises, the Natural Law Party failed to win any seats in the Canadian Parliament. One noteworthy race included Doug Henning, now Dr. Doug Henning, who as the NLP candidate captured just above 1 percent of the votes (roughly 1,000 of 85,000) in the electoral district of Rosedale.

—*Tom Genoni, Jr.*



The Natural Law Party said it would maintain "a group of 10,000 Yogic Flyers to create an indomitable influence of harmony and positivity" through Canada "by enlivening the Unified Field of Natural Law in national consciousness." (Illustration from NLP's Canadian campaign literature.)

Sagan To Receive National Academy's Public Welfare Medal

Carl Sagan, the noted astronomer, educator, and Pulitzer Prize-winning author, has won the 1994 Public Welfare Medal, the National Academy of Sciences' highest honor.

The medal, awarded annually since 1914, is presented to "honor extraordinary use of science for the public good," the Academy said.

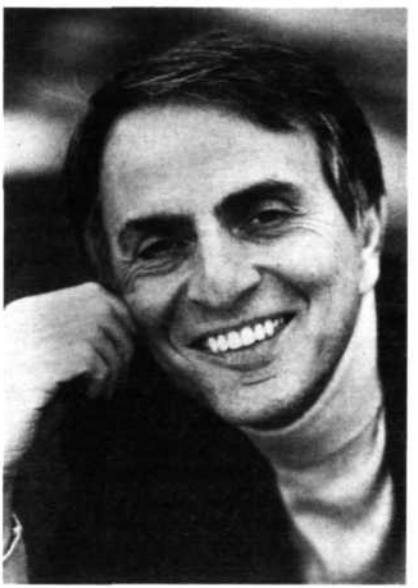
"In the public view," said Academy President Bruce Alberts, "Carl Sagan's name may be associated more with science than that of any other living U.S. scientist. This award clearly honors a very distinguished individual who has played a critical role in promoting the understanding of science worldwide."

Peter H. Raven, the NAS home secretary and chair of the selection committee, said: "Carl Sagan has been enormously successful in communicating the wonder and importance of science. His ability to capture the imagination of millions and to explain difficult concepts in understandable terms is a magnificent achievement."

Sagan, David Duncan Professor of Astronomy and Space Sciences at Cornell University and director of Cornell's Laboratory for Planetary Studies, said he was "honored and delighted" with the award, which will be presented at the NAS annual meeting in Washington on April 25.

Sagan has been a Fellow of CSICOP since its inception in 1976. In 1987 he was the recipient of CSICOP's In Praise of Reason Award, and he will be the keynote speaker at CSICOP's 1994 annual conference, June 23-26, in Seattle.

Sagan was active in NASA's Mariner, Viking, Voyager, and Galileo expeditions to other planets and throughout his career has carried out research into planetary atmospheres, the greenhouse effect on Venus, the origin of life on earth, and the possibilities of life elsewhere. He has received NASA medals twice for Distinguished Public Service and once for Exceptional Scientific Achievement.



He is perhaps best known to the public for his PBS television series and best-selling book *Cosmos*, his articles on science in *Parade* magazine, and books such as *Comet*, *Broca's Brain*, *Contact* (a novel), *The Cosmic Connection*, and the *Dragons of Eden*, which won a Pulitzer Prize. One of his most interesting books, less well known to the public, is *Intelligent Life in the Universe* (1966). This was a collaboration between Sagan, then in his early 30s, and the noted Russian astronomer I. S. Shklovskii.

—*K. Frazier*

SI Included in InfoTrac Indexes

In our Summer 1991 issue, we announced that the *Readers' Guide to Periodical Literature* was including the SKEPTICAL INQUIRER among the more than 200 magazines it indexes. We are now pleased to report that the Information Access Company will include the SKEPTICAL INQUIRER (backdated to the Winter 1992 issue) in the following *InfoTrac* databases:

- *Expanded Academic Index*
- *Academic Index on CD-ROM* and *Academic Index On-Line*
- *Magazine Index Plus* and *Magazine Index Plus On-Line*
- *General Periodicals Index-Public Library Edition*

The *Readers' Guide* and *InfoTrac* are general-purpose indexes that serve a wide range of students, scholars, authors, and journalists, and almost all libraries subscribe to one or the other, or both. They are often the first sources researchers consult when gathering information on a particular topic. The addition of *SI* to these indexes will bring our critical evaluation of the paranormal and promotion of critical thinking to the attention of an even wider audience and should result in many more libraries' carrying the SKEPTICAL INQUIRER.

—*Jonathan Jiras*

Ig Nobles Honor Best of the Worst

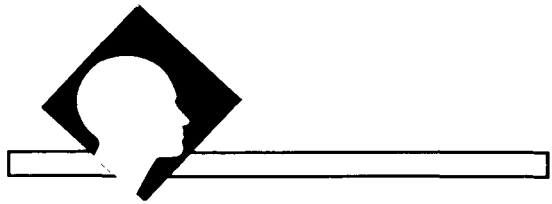
For a third consecutive year, the MIT Museum and the *Journal of Irreproducible Results* have awarded their Ig Noble prizes to those whose recent research "cannot or should not be reproduced." Among the "winners" at this year's ceremony were several persons familiar to readers of the SKEPTICAL INQUIRER.

Author Louis Kervran was the recipient in Physics for his book *Biological Transmutations*, in which he argues that a cold-fusion process produces the calcium in eggshells. (See "Cold Fusion Chicken," *SI*, Winter 1992, p. 122, and "Atomic Arithmetic," Fall 1992, p. 93.) In Psychology, John Mack of Harvard Medical School and David Jacobs of Temple University won for their conclusions that many of their patients who claim to have been abducted by aliens actually have been. And, in Mathematics, Robert Faid of Greenville, South Carolina, took the prize for calculating the exact odds (8,606,091,751,822:1) that Gorbachev is the Antichrist.

Added to this year's ceremony were 30-second-long Heisenberg Certainty lectures. One speaker delivered his speech in Pig Latin, while another, although speaking in English, was frequently interrupted by members of the PLO (Proton Liberation Organization) protesting the Superconducting Supercollider, since made moot when Congress canceled it. "Billions of subatomic particles will be threatened every picosecond!" members shouted. "Stop the carnage!"

—*Tom Genoni, Jr.*

Research Review



This is the first contribution to a new department, in which a knowledgeable researcher reports on a recent noteworthy scientific paper, places it into perspective, and comments on its significance.—THE EDITOR

Studying the Psychology of the UFO Experience

ROBERT A. BAKER

Empirical studies of people alleged to have had UFO experiences are hard to come by because of the relative rarity of such claimants, the shortage of interested and scientifically trained investigators, and the esoteric nature of the subject matter. A new study by Nicholas P. Spanos and colleagues in the Carleton University Department of Psychology in Ottawa, Canada, is noteworthy in that it has managed to overcome these obstacles ("Close Encounters: An Examination of UFO Experiences," by Nicholas P. Spanos, Patricia A. Cross, Kirby Dickson, and Susan C. DuBreuil, *Journal of Abnormal Psychology*, 102(4): 624-632, 1993). This study is significant, in my opinion, because it shows that the earlier explanatory accounts of this phenomenon are somewhat flawed and it also points to the most probable or "true" explanation for these curious reports.

Recognizing at the outset that claims of alien encounters and alien abductions are a social-psychological rather than a material or physical problem, Spanos et al. sought to test two general hypotheses. The first is that people making such claims are psychologically or psychosocially disturbed, i.e., pathological. The second argues that these people have strong imaginative powers and are "fantasy prone," i.e., people who are easily hypnotized and who weave elaborate fantasies around internal sensations and external suggestions and then are convinced that the fantasies are "real."

Using 176 adults, one group of 49 UFO reporters recruited through newspaper ads and two comparison groups—one of 53 community volunteers and the other of 74 university students—the psychologists gave the three groups a series of psychological tests and questionnaires. Subjects in the UFO group also received an hour-long, semistructured interview and were asked about their UFO experiences and their beliefs. The interviews were scored by independent judges and were rated for the emotional intensity and subjective reality of the UFO encounter.

The psychological measures used are all standard, valid, and reliable. Well-accepted measurements were used to determine psychopathology, intelligence, social and emotional adjustment, cognitive ability, and fantasy proneness.

In analyzing the results, the UFO reporters were divided into two

groups: those who simply saw lights in the sky and scored very low on the belief intensity dimension and those who scored much higher on the emotional and reality scales. All four groups were then compared: 31 UFO-intense subjects; 18 UFO-nonintense subjects; 53 community adults; and 74 students. Differences between the groups on each of the test battery variables were analyzed with a series of one-way analyses of variance.

Both UFO groups held significantly more exotic beliefs than subjects in the comparison groups, and they also attained higher scores on five of the psychological health variables. In short, the findings provide no support whatsoever for the hypothesis that UFO reporters are psychologically pathological. Regarding the "fantasy" hypothesis, no group differences were found on the temporal lobe lability scale, on the three imaginal propensity measures, and on three indexes of hypnotizability—all recognized measures of fantasy proneness. There were, however, major differences between the intense and nonintense UFO groups with regard to whether or not their experiences were sleep related. UFO-intense subjects reported that their experiences were sleep related significantly more often than did the nonintense subjects. Only one subject in the nonintense group said his experience was related to falling asleep, dreaming, or waking up; 58 percent of the intense subjects described their experience as sleep related.

In their discussion, the authors interpret their findings as failing to confirm either the psychopathology or fantasy-prone hypothesis about UFO close-encounter experiences. Not only were the UFO groups as mentally healthy as the controls but the UFO groups were no different from the controls on any of the imaginal propensity measures. The finding that did most clearly differentiate the UFO and comparison groups was belief in UFOs (as alien spacecraft) and in the reality of alien life-forms. The authors also suggest that many of the UFO subjects believed in alien existence long before having any UFO experiences. In their words (p. 631):

> Our findings suggest that intense UFO experiences are more likely to occur in individuals who are disposed to esoteric beliefs in general and alien beliefs in particular and who interpret unusual sensory and imaginal experiences in terms of the alien hypothesis. Among UFO believers, those with stronger propensities toward fantasy production were particularly likely to generate such experiences. Moreover such experiences were likely to be generated and interpreted as real events rather than imaginings when they were associated with restricted sensory environments that contributed to confusion between internally produced images and sensations and external events (e.g., experiences that occurred at night and in association with sleep).

The authors also caution that to understand the elaborate and often bizarre reports of those in the intense group it is important to note that most of these reports (60 percent) were sleep related. Although some were merely dreams of UFOs and aliens, the sleep-related UFO experiences involving paralysis were also usually accompanied by visual or auditory hallucinations, or both, and sometimes by the sense of a presence that was somehow felt but not seen.

Baker (1992), in an unpublished but widely distributed paper, "Alien Abductions or Human Productions: Some Not So Unusual Personal Experiences," has also called attention to the striking similarity between reports

"The major importance of this study is that it shifts attention from the false leads of pathology and neurological aberrations to the true path of false beliefs that are engendered by a common but little recognized type of sleep disorder."

of alien abductions (as chronicled by clients of Hopkins [1987], Jacobs [1992], and Mack [1992], as well as Whitley Strieber, regarding his own abduction claim in *Communion*) and the medical reports from people having sleep paralysis with hypnagogic and hypnopompic hallucinations (Rehm 1991: Siegel 1992). For all practical purposes, the two sets of reports are identical. A comparison of UFO-abduction reports and the medical reports of sleep paralysis with accompanying hypnagogic and hypnopompic hallucinations show the two to differ only in the hallucinatory content. Ghosts and demons dominate the medical, historical, and folklore narrations; UFOs and aliens appear in modern reports. Explanations for other psychological manifestations alleged to accompany the abduction scenario are also provided in the Baker report.

While the Spanos et al. study adds significantly to our understanding of the personality characteristics of those individuals reporting UFO encounters and who believe in the extraterrestrial hypothesis (which is, after all, the crux of the matter), it should not be forgotten that people claiming abduction by aliens are relatively few in number. This is certainly the case in the Spanos study. Most important, the Spanos study outcome must not under any circumstances be construed as providing aid and comfort to those believers in either the extraterrestrial hypothesis or the credibility of alien abductions. This has, unfortunately, already happened in several instances where the media have left the impression that if those who believe in UFOs and alien abductions are neither "crazy" nor "fantasy prone" then their beliefs in extraterrestrial visitations have been validated.

The major importance of this study is that it shifts attention from the false leads of pathology and neurological aberrations to the true path of false beliefs that are engendered by a common but little recognized type of sleep disorder.

The fact that UFO contactees and abductees are not pathological is, however, not surprising to experienced anomalistic psychologists, who have long been aware that delusions, i.e., false beliefs, are common coin and in no way are indicative of pathology. Unless our delusions interfere with our social and personal adjustment or are so pervasive as to endanger our lives and the lives of others, they are usually ignored. Often these false beliefs may serve to help us keep our mental balance and even cope with life's stresses and strains, as in the case of our religions. Many noted and distinguished psychiatrists also hold to what most scientifically trained people would consider to be false beliefs. Raymond Moody, in his latest book, *Reunion* (1993), says he converses frequently with visions of his dead relatives. M. Scott Peck believes in demon possession as the true explanation for many multiple personality disorders (1983, 1984) and Colin Ross believes that most skilled athletes have and use psychokinetic powers (1989). Accord-

ing to the December 27, 1993, *Time* magazine, 69 percent of the American public believe in the existence of angels and 46 percent believe they have their own guardian angel. One person's conviction and reality are another person's fantasy and delusion. Some people believe they have been abducted by aliens. Most of us do not.

It is also important for the public to realize that people who *are* pathological or "crazy" are not "crazy" all over or "crazy" all the time. We are only "crazy" in spots and only on occasion, not continuously. Psychiatric diagnosis is not an easy task, as the *Diagnostic and Statistical Manual of Mental Disorders*, the famous Rosenhan study (1973), and the difficulties of dealing with factitious disorders (Feldman and Ford 1994) attest. In this regard the Spanos et al. conclusion, that "among UFO believers, those with strong propensities toward fantasy production were particularly likely to generate such experiences" (p. 631), again calls attention to the important role that imagination and fantasy play in the production of alien-contact and alien-abduction reports. A similar conclusion was also reached by Ring and Rosing (1990) in their survey of people reporting UFO encounters and abductions.

Although the two studies are somewhat familiar in intent and design, the Spanos et al. study is by far the superior one and sticks to the mundane three-dimensional world of cold, hard reality rather than soaring off into alternate realities and universes to account for a very worldly human experience based upon beliefs in alien visitation. These beliefs, say the authors, "serve as templates against which people shape ambiguous external information, diffuse physical sensations, *and vivid imaginings* [emphasis added] into alien encounters that are experienced as real events" (p. 631). Of the experimental and empirical studies we have of this particular problem, the Spanos et al. study is the best thus far.

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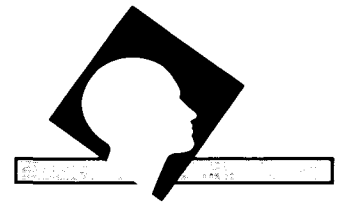
Notes of a Fringe-Watcher



MARTIN GARDNER

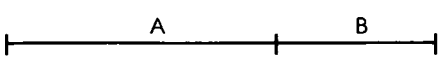
☐ *The Cult of the Golden Ratio*

Geometry has two great treasures: one is the Theorem of Pythagoras; the other, the division of a line into extreme and mean ratio. The first we may compare to a measure of gold, the second we may name a precious jewel.

—Johannes Kepler

Webster's Ninth New Collegiate Dictionary has several definitions of "cult." One is: "great devotion to a person, idea, or thing; *esp:* such devotion regarded as a literary or intellectual fad." For more than a century a cult, in the sense just defined, has flourished with respect to an arithmetic ratio known variously as the "divine proportion," the "extreme and mean ratio," and the "golden ratio."

Place a point on a line so that it cuts the line into two segments, A and B, such that the length of the line is to A as A is to B. A and B are then in golden ratio to each other.



It is easy to show that this ratio is the root of the equation $x^2 - x = 1$. Applying the quadratic formula gives x a value of 1.61803398+, an irrational number that is half the sum of 1 and the square root of 5. In the U.S. this number is customarily designated by φ, the Greek symbol for phi.

Phi is almost as ubiquitous in mathematical structures as *pi* or *e*. The reason, of course, is the simplicity of the equation that produces it. As might be expected, it is also the sum of the simplest possible continued fraction:

$$1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \ldots}}}$$

Phi is the only positive number that becomes its own reciprocal by subtracting 1. Because $1/\varphi$ is .61803398+, the same infinite sequence of decimal digits, some mathematicians have preferred to call .618 . . . the golden ratio. It doesn't matter because you get the same sequence of decimal digits regardless of whether you divide line segment A by B or vice versa.

Phi is related to a generalized Fibonacci sequence in a startling way. Begin with any two numbers, rational or irrational, add them to get a third number, then add the second and third to get the fourth, and so on, always recursively generating the next number as the sum of the two previous ones. As the sequence goes to infinity, the ratio of two adjacent

numbers approaches phi as the limit.

Consider the simplest Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, . . . Divide 89 by 55 and you get 1.618+, or phi correct to three decimals. Continue five more steps to 987/610 and you produce the golden ratio to five decimal places.

Since the Renaissance, an enormous literature has accumulated, most of it nonsense, about the application of the golden ratio to architecture, painting, sculpture, nature, and even to poetry and music. The first great work defending this inflated worship of phi was a 457-page German treatise, *Der Goldene Schnitt* (The golden cut), published in 1884 by Adolf Zeising. Early works in English, following Zeising's lead, were *Nature's Harmonic Unity* (1913) by Samuel Coleman, and *The Curves of Life* (1914), by Theodore Cook. Similar books have been published since, and others are still being written.

My discussion here of what can be called pseudomathematics is based mainly on George Markowsky's sensible paper, "Misconceptions About the Golden Ratio," in the *College Mathematics Journal* (vol. 23, January 1992, pp. 2-19). Markowsky is a computer scientist at the University of Maine. His paper can be consulted for more details and for its valuable list of 59 references. See also the chapter on phi in my *Second Scientific American Book of Mathematical Puzzles* and *Diversions*, where I myself fell for some misconceptions.

The most persistent misconception is the belief that the "golden rectangle," a rectangle with sides in golden ratio, is the most aesthetically pleasing of all rectangles. The first effort to prove this was undertaken by Gustav Fechner (1801-1887), an eccentric German physicist and psychologist who held bizarre opinions. He believed, for example, that the sun, the moon, and all the planets are living organisms and that even a pebble has a "soul." In one experiment he exhibited ten rectangles of varying shapes and asked subjects to select the one they considered most attractive. About three-fourths of their choices were rectangles with side ratios of .57, .62, and .67.

As Markowsky writes, far from establishing the golden rectangle as the most beautiful, Fechner showed that people prefer a rectangle within a fairly large range; not too close and not too far from a square. Fechner made other experiments to prove that phi was the most pleasing of all ratios, but they were crude by today's standards.

Recent research has shown that the golden rectangle does not score any better than rectangles similar to it, such as a 3 × 5, the shape of a file card. To demonstrate how vague such preferences are, Markowsky drew the chart shown in Figure 1, containing 48 rectangles, and asked students to identify the two golden forms. Most of them could not. He then arranged the same rectangles in linear order (Figure 2), their ratios ranging from .4 to 2.5. He found wide variations in choices. Moreover, when asked to pick the most pleasing shape in each chart, subjects rarely chose the same one. The rectangle most often selected was the one in row 3 in column 4 of Figure 1—a rectangle with sides in a 1.83 ratio.

The efforts of phi cultists to find golden rectangles in architecture, painting, and sculpture reached absurd heights. It is easy to see how this happened. Measurements of parts of a building, or work of art, have such fuzzy boundaries that it is easy to find phi when ratios close to phi fit just as well. Markowsky demolishes the notion that phi is involved in the proportions of the Great Pyramid of

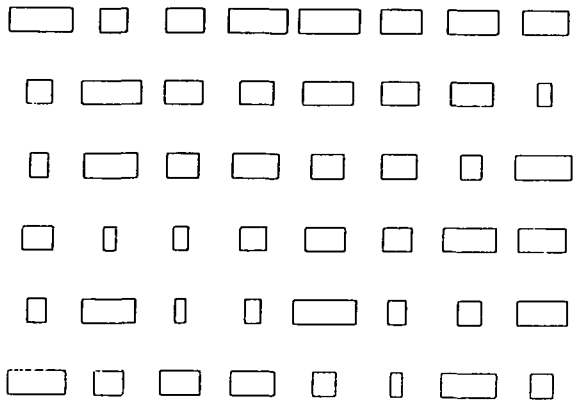


FIGURE 1. Forty-eight rectangles with ratios from .4 to 2.5 in random order.

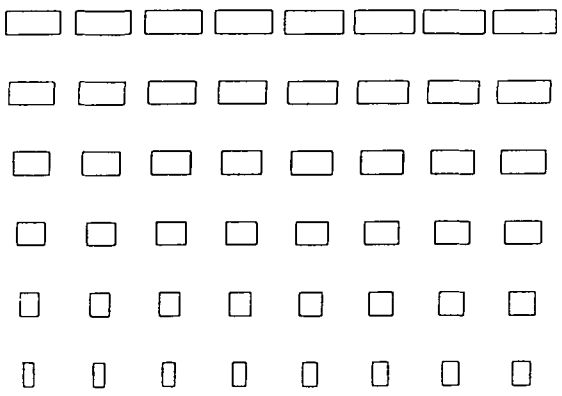


FIGURE 2. The same rectangles in linear order.

Egypt or in those of the Greek Parthenon. There is not the slightest evidence that the Egyptians, Greeks, or any other ancient people, used phi in any of their buildings or art. As Markowsky says: "The dimensions of the Parthenon vary from source to source probably because different authors are measuring between different points. With so many numbers available a golden ratio enthusiast could choose whatever numbers gave the best result."

Because Leonardo da Vinci illustrated one of the earliest books on phi, *De Divina Proportione*, by Luca Pacioli, phi cultists have imagined that the ratio was intentionally used by Leonardo in many of his paintings. In every case the application of golden ratios to a Leonardo painting is extremely arbitrary and obtained only by fudging. Parts of a figure will extend beyond the borders of the imagined rectangle, and other parts will fail to touch the borders. There is no evidence that Leonardo da Vinci, or any other Renaissance artist or sculptor, used phi in his work. This does not apply to the twentieth century. A few modern architects, painters, and even music composers, fascinated by the golden ratio, have made deliberate use of it.

Phi buffs are also fond of asserting that on most men and women the

navel divides their height in a golden ratio. Indeed, this was one of Pacioli's claims. Why nature would arrange this is never made clear. In any case, it isn't true. Navel height, in relation to body height, varies considerably with race and locale, covering a range that of course includes 1.618. Moreover, as Markowsky points out, such measurements are not precise because navels are not points, but areas of nontrivial diameter.

Four persons at Middlebury College, in Vermont, measured the navel heights of 319 college men and women, reporting their results in "The Golden Midd," *Journal of Recreational Mathematics* (vol. 24, 1992, pp. 26-29). They summarize their findings as follows: "For the students who endured a bellyful of statistics, the Golden Midd is no Golden Mean. Admittedly, measurement error in this study was a ticklish problem. But, assuming no systematic bias to these errors, we conclude that a practitioner of navel art who wishes to capture divine proportions would have to place the bellybutton of a typical Middlebury College coed about 0.7 inches higher than it really is."

Phi enthusiasts have also found the golden ratio in the forms of birds, insects, fish, and other animals. "Of course, wings, legs and fins can be moved over a wide range of positions, Markowsky writes, "and it is not surprising that the golden rectangle can often be produced." In spite of such arbitrariness, some writers on phi have found the golden ratio in animal forms to a precision of five decimal places!

A fascinating property of the golden rectangle is shown in Figure 3. By snipping off squares, it can be divided into an infinite sequence of whirling squares and golden rectangles. The vertices trace a precise logarithmic spiral. It is true that spirals closely resembling logarithmic ones abound in nature—the chambers of a chambered nautilus is the most cited instance—but again the spirals vary within a considerable range even in the case of the nautilus.

It is hard to believe, but phi mania has even invaded literary criticism. George E. Duckworth, in *Structural Patterns and Proportions in Virgil's Aeneid* (University of Michigan Press, 1962), provides the major instance. By

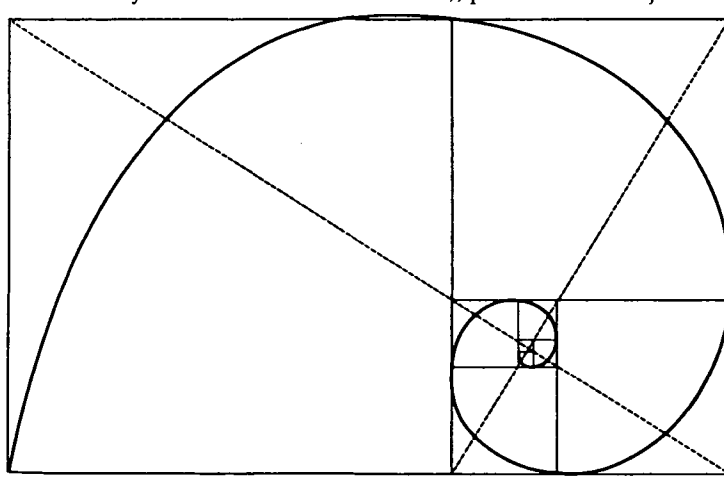


FIGURE 3. A logarithmic spiral generated by whirling squares and golden rectangles. The spiral "strangles" the intersection point of the two dotted diagonals. The diagonals are in golden ratio.

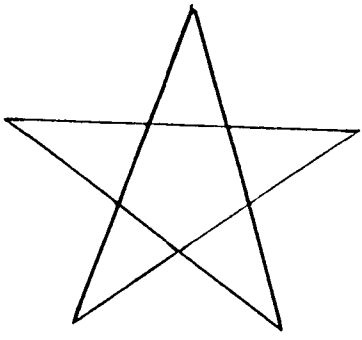


FIGURE 4. The pentagram, mystic symbol of the Pythagorean Brotherhood, and the pattern Goethe's Faust used for trapping Mephistopheles. Inverted, it is a satanic symbol.

reputable books of literary criticism.

Although finding phi in nature and art has all the earmarks of pseudo-math, no one can deny that the golden ratio is encountered with surprising frequency in geometry and algebra. One of the oldest, most striking examples is the pentagram shown in Figure 4, the magic symbol of the ancient Pythagorean Brotherhood. Every line segment in the pentagram is in golden ratio to the segment of next smaller length.

Two other delightful constructions in which phi unexpectedly turns up are shown in Figure 5.

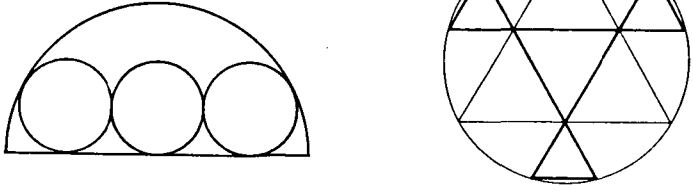
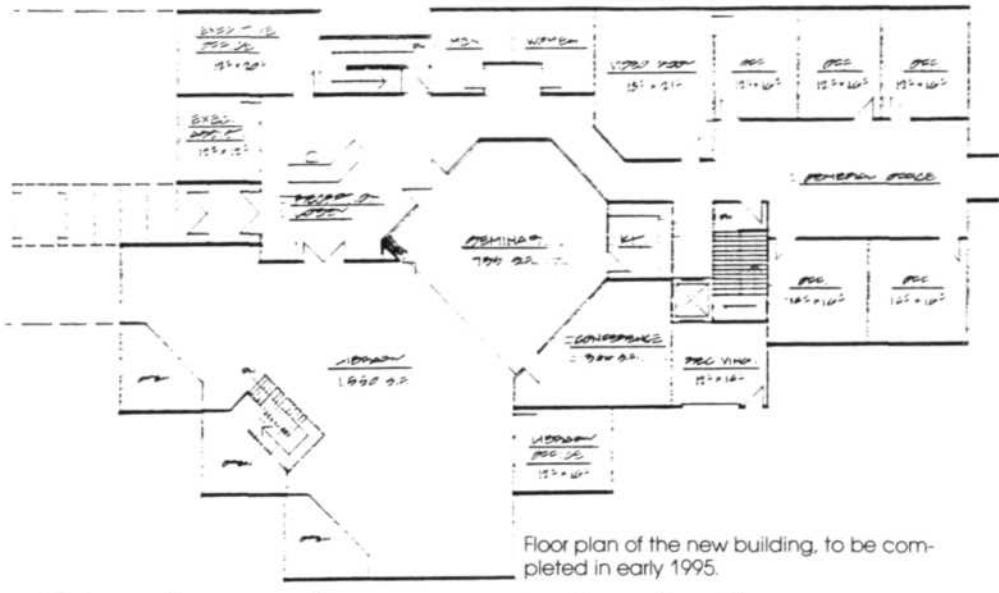


FIGURE 5. On the left, the radius of a large circle divided by the diameter of one of the small circles is phi. On the right, the side of one of the four larger equilateral triangles divided by the side of one of the three smaller ones is phi. Readers skilled in plane geometry may enjoy proving both assertions.

measuring the number of lines in various parts of Virgil's epic, Duckworth (who died in 1972) claims that Virgil made frequent and conscious use of the golden ratio. Markowsky summarizes objections to Duckworth's claims, and they can be found at greater length in "How to Find the 'Golden Number' Without Really Trying," by Roger Fischler, in the *Fibonacci Quarterly* (vol. 19, 1981, pp. 406-410), in "Aeneid I and .618?" by Jane Bews, in the *Phoenix* (vol. 24, 1970, p. 130-133), and "Extreme and Mean Ratio in Virgil?" by William Waterhouse, in the *Phoenix* (vol. 26, 1972, pp. 369-376). In spite of such vigorous criticism, praise of Duckworth's research turns up in several

Of course there are a raft of ratios close to phi that arise from equally simple constructions. The simplest is 3/5 = .6 (or 1.666. . . , if the fraction is inverted). It would be amusing, if one had the time and inclination, to see how easily 3/5 can be found in the architectural structures of the ancients, in great works of art and literature, and in the forms of animals and humans.

Martin Gardner's latest math-recreation book is Fractal Music, Hypercards, and More *(W. H. Freeman). His most recent nonmath book is* The Healing Revelations of Mary Baker Eddy *(Prometheus Books).*



Floor plan of the new building, to be completed in early 1995.

Taking advantage of low-interest rates and a soft construction market, we have begun construction of the Center for Inquiry, Phase II. This is the long-awaited completion of CSICOP's headquarters campus, consolidating SKEPTICAL INQUIRER's Buffalo-area administrative, editorial, production, and warehousing activities in one efficient facility.

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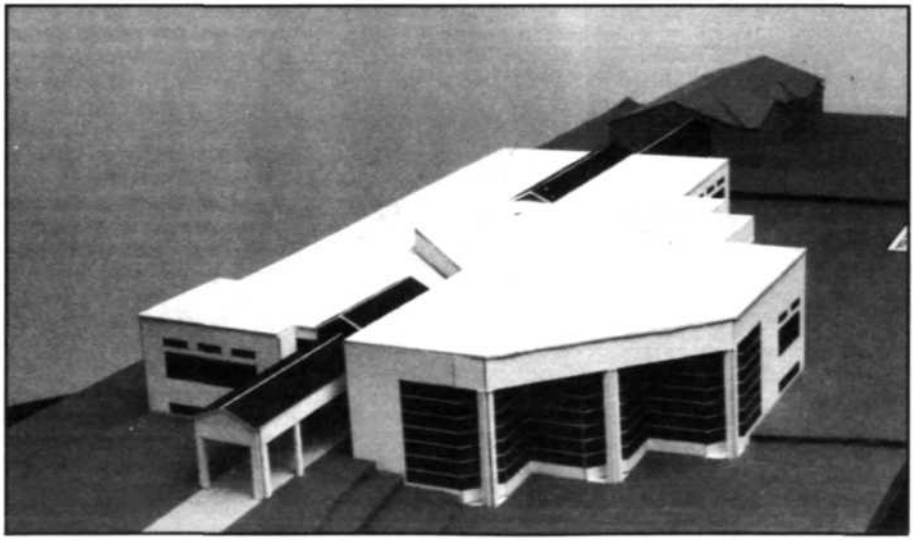

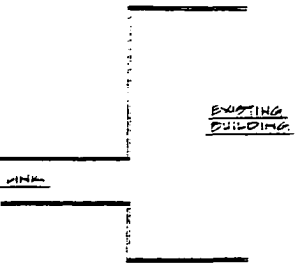

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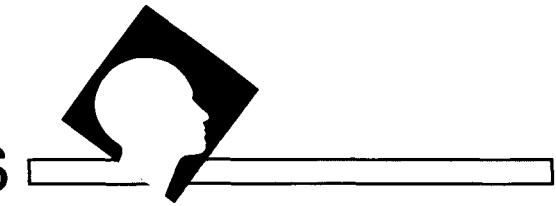
Architect's model of the Phase II building. Sculpted windows mark location of library.

Psychic Vibrations



It's All a Conspiracy, and It's Invisible

ROBERT SHEAFFER

The unfortunate sudden and unexpected loss of NASA's Mars Observer spacecraft has given rise to all manner of bizarre claims. Richard Hoagland, one of the leading champions of the "Face on Mars" (see this column, Fall 1991), suggested at a news conference that a "rogue group" within NASA itself was responsible for scuttling the mission because it threatened to confirm Hoagland's theory that Mars is inhabited by intelligent beings. Outside the main gate of NASA's Jet Propulsion Laboratory in Pasadena, about 50 protesters marched, carrying signs with messages like "Face Up to It, NASA!" Mission director Glenn Cunningham said: "It's absolutely the craziest thing I've ever heard. There is absolutely no conspiracy. Everything about this mission is open to the public." The conspiracy-mongers, however, were not convinced.

Meanwhile, former NASA astronaut-trainee-turned-psychic Brian O'Leary theorized that the probe had been "tampered with" either by NASA "so it could clandestinely take pictures of Cydonia without the public's awareness," or else by "an alien intelligence operating in the vicinity of the Martian surface" that obviously did not wish to be spied upon. O'Leary issued a press release stating that at exactly 7:50 P.M. on September 24, 1993, he would lead the attendees at a UFO/New Age conference in Phoenix in "a scientific experiment designed to project massive amounts of 'mental energy' toward the red planet in order to reactivate the malfunctioning spacecraft." And the spacecraft, at that precise moment, did absolutely nothing.

In other conspiracy developments, a 14-page report has been circulating rapidly throughout UFOdom claiming that physicist Bruce Maccabee, of the Fund for UFO Research, is actually a CIA agent working to disinform UFO researchers. The "proof" of this was that Maccabee had given a few "brown bag" lectures on UFOs to interested CIA employees during their lunch hour, arranged by his friend Roland Pandolfi, a physicist who works for the CIA. Maccabee regaled them with tales about the MJ-12 papers, the Gulf Breeze UFO sightings, and other deep mysteries. As if this were not bizarre enough, Philip J. Klass writes in his *Skeptics UFO Newsletter* that John Gibbons, President Clinton's Chief Science Advisor, recently asked the CIA for a background paper on UFOs. The CIA passed the request to Pandolfi, probably because nobody else in the agency seemed as interested in the subject as he, who in turn passed on the request to Maccabee, who prepared it. Mac-

cabee's report was titled "Briefing on the U.S. Government Approach to the UFO Problem as Determined by Civilian Researchers During the Last Twenty Years." Thus Gibbons was placed in the strange position of receiving a briefing paper from the CIA charging that the CIA had been covering up UFO crashes and alien abductions for many decades but providing absolutely no proof. Gibbons was probably wise enough to ignore it.

More than two years have now elapsed since conspiracy-oriented UFOlogist Bill Cooper's 1991 warning that the sinister New World Order was going to abolish U.S. national sovereignty, along with the Bill of Rights, "within two years" (see this column, Spring 1992). Cooper is still drawing crowds to his lectures and seminars, his followers apparently undaunted "when prophecy fails." His latest endeavor is an attempted hostile takeover of Gannett Co., Inc. (*GCI* on the New York exchange), which owns many newspaper, radio, TV, and advertising subsidiaries, and publishes *USA Today*. Cooper obviously hopes to become a media mogul like Rupert Murdoch or the late Robert Maxwell, which would then allow him to present his wild conspiracy theories directly to the American public. However, given that Cooper's effort to acquire *GCI* undoubtedly falls a few billion dollars short of what would be needed, he is taking his campaign directly to the American people: "Concerned Americans will buy from 5 to 10 shares of GANNETT Co., Inc., purchasing additional shares according to financial ability. Individuals are to retain possession of their shares but assign the proxy votes to William Cooper. . . . The goal is CONTROL, not profit." Cooper's plan is about as realistic as that of a flea attempting to take over a dog.

* * *

The newest wrinkle in UFO-abduction studies involves the scientific study of invisibility. Budd Hopkins, chief guru of the UFO-abduction proponents, has been grappling with the question of how thousands, if not millions, of people can allegedly be abducted by aliens each year without having one abduction witnessed (let alone filmed on a portable camcorder!) by people on the street, especially since many alleged abductions occur in the heart of our largest cities, whose streets are far from deserted, even in the middle of the night.

The answer to this puzzle, Hopkins suggests, is *invisibility*, meaning that

UFOs and UFOnauts are somehow able to emulate Claude Rains in *The Invisible Man*, the movie version of H. G. Wells's thriller. Hopkins explained to the 1993 Mutual UFO Network Conference how he was approached while on a lecture tour of Australia the previous year by a middle-aged couple telling a tale of being rendered invisible during an ongoing UFO-abduction, during which time their children were allegedly missing. As proof of their story, they produced a photo taken at a park on a beach, in which they do not appear. Hopkins, obviously much impressed by the weight of evidence, stated that all four of them "became invisible, though they were not aware of that fact. Their body, their clothing, even their camera, were in effect invisible to the other visitors at the playground late on a warm Saturday morning." It is a good thing that no jogger ran into them, as broken bones easily could have resulted. Echoing the "invisibility" theme, David Michael Jacobs, Hopkins's colleague, told a recent lecture audience that the *real* mystery about UFOs is why they are ever seen at all. Given that the cross-breeding program between aliens and humans is "central" to the UFO phenomenon (this program has progressed far beyond the stage of an "experiment," Jacobs insists), Jacobs finds it difficult to understand why any nonabductee ever witnesses any alien activity at all.

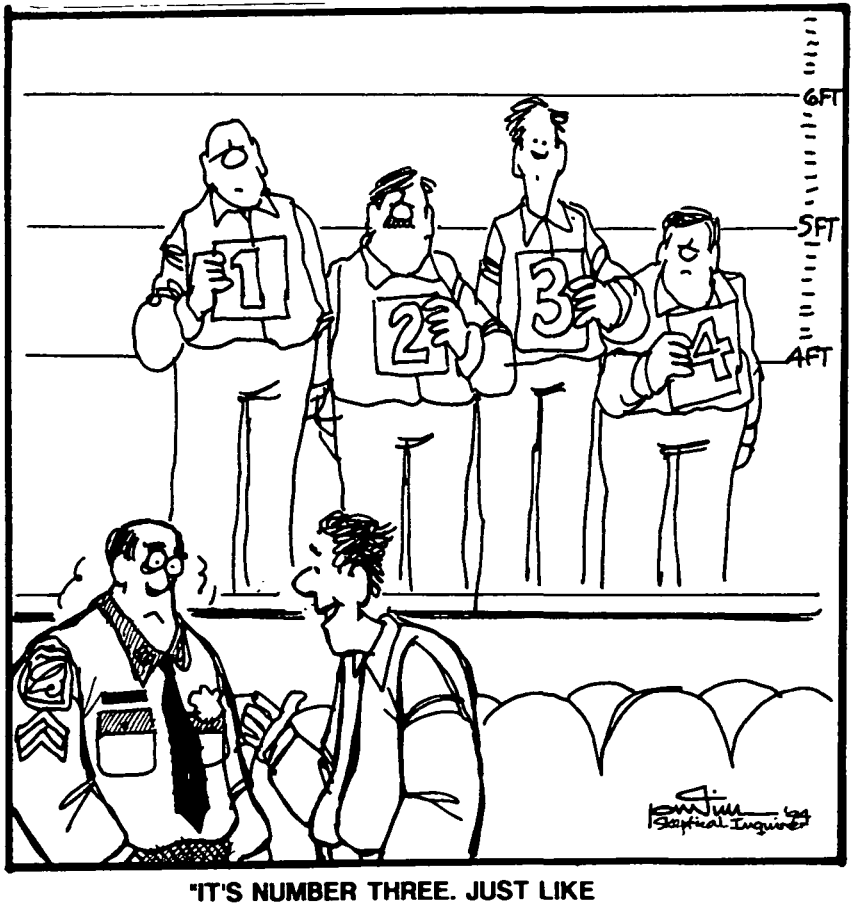
However, some organizations are having great difficulty dealing with unorthodox UFO-abduction theories, meaning those that are insufficiently bizarre. The late Charles Fort wrote *The Book of the Damned*, the "damned" being certain supposed facts, such as rains of frogs, that were allegedly too heretical for science to deal with and so were condemned to oblivion because of scientific cowardice. His followers today have formed the International Fortean Organization (INFO) and enjoy tweaking the noses of the scientific community, charging that they are too cowardly to face up to unorthodox ideas. But it turns out that some theories are just too "damned" to be faced by the Forteans themselves.

In March of 1993, the International Fortean Organization published "Demons, Doctors, and Aliens," by James Pontolillo, subtitled "An Exploration into the Relationships Among the Witch Trial Evidence, Sexual-Medical Traditions, and Alien Abductions." In it Pontolillo examines contemporary claims of UFO abductions, in the context of seventeenth-century witch hysteria and historical sightings of incredible things. He concludes that "alien abductions are the continuation of an ancient, ongoing cycle of religio-mythic beliefs." The publication of this paper caused a furor within the Fortean organization. The editor-in-chief of the *INFO Journal*, Michael T. Shoemaker, stated that Pontolillo's paper "is *not* an INFO paper," even though it bears the designation "INFO Occasional Paper #2" and was advertised for sale by the *INFO Journal*. Rather, says Shoemaker, "its publication was carried out in secret by a small cabal without the authorization or knowledge of the Board of Directors of INFO. The persons responsible have now resigned from the board." ("We did not do this: and we promise not to do it again!") In Fortean promotional material in which Pontolillo's paper is still listed, this item has been scratched out by a pen. *Some* theories are just too "damned" much for the followers of Charles Fort!

Dennis Stacy, editor of the *MUFON Journal*, lamented, "I'm particularly disturbed because it appears that freedom of expression,

particularly the freedom of skeptical expression, is no longer a welcome commodity within the UFO and Fortean community." This was published just about the same time that MUFON demoted its local Florida officials Terrell and Frances Ecker and disassociated itself from their newsletter. The "heresy" of the Eckers was to question the validity of the Gulf Breeze UFO photos of Ed and Frances Walters. Willy Smith, a UFOlogist who is skeptical of the Walters case, has compiled statistics purporting to show that MUFON's membership has increased fourfold since, and presumably because of, its wholehearted embrace of that sensational but highly implausible UFO series (see this column, Summer 1991). MUFON also recently purged Donald Ware, its former Eastern Regional Director, for dabbling too much in "New Age" beliefs. They felt that kind of stuff was too "far out," and that MUFON officials ought to concentrate on serious UFO cases, like those where people claim to have been levitated by aliens and floated out of closed windows. □

OUT THERE Rob Pudim



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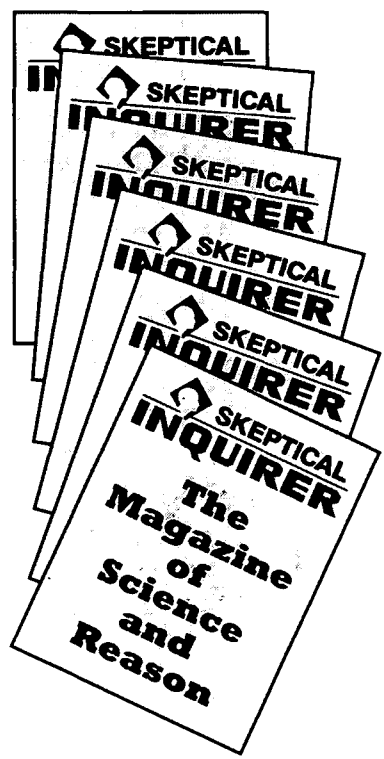
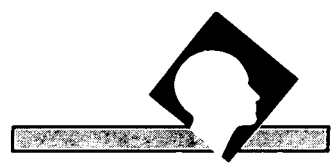


Watch for further details!

The Growth of Antiscience

PAUL KURTZ

It is paradoxical that today, when the sciences are advancing by leaps and bounds and when the earth is being transformed by scientific discoveries and technological applications, a strong antiscience counterculture has emerged. This contrasts markedly with attitudes toward science that existed in the nineteenth and the first half of the twentieth centuries. Albert Einstein perhaps best typified the high point of the public appreciation of scientists that prevailed at that time. Paul De Kruif (1926), in his book, *The Microbe Hunters*, described the dramatic results that scientists could now achieve in ameliorating pain and suffering and improving the human condition. John Dewey, perhaps the most influential American philosopher in the first half of this century, pointed out the great pragmatic benefits to humankind from the application of scientific methods of thinking to all aspects of human life. But today the mood has radically changed.



The scientific approach, which has been so successful in extending the frontiers of knowledge, is now under heavy attack, from many sides. The advocates of science had better wake up.

A recent essay in *Time* magazine (Overbye 1993) begins with the following ominous note:

> Scientists, it seems, are becoming the new villains of Western society. . . . We read about them in newspapers faking and stealing data, and we see them in front of congressional committees defending billion-dollar research budgets. We hear them in sound bites trampling our sensibilities by comparing the Big Bang or some subatomic particle to God.

An editorial in *Science* magazine (Nicholson 1993), referring to the *Time* essay, comments:

> Does this reflect a growing antiscience attitude? If so, the new movie *Jurassic Park* is not going to help. According to both the writer and producer, the movie intentionally has antiscience undertones. Press accounts say that producer Steven Spielberg believes science

"The most vitriolic attacks on science in recent decades have questioned its benefits to society. . . . They question the value of scientific research and the scientific outlook to humankind."

is "intrusive" and "dangerous."

It is not only outsiders who are being critical. In recent speeches and publications, George Brown, chairman of the House Space, Science and Technology Committee, has seemed to question the very value of science. Brown has observed that despite our lead in science and technology, we still have many societal ills such as environmental degradation and unaffordable health care. Science, he says, has "promised more than it can deliver." Freeman Dyson seems to share some of this view. In a recent Princeton speech, he states, "I will not be surprised if attacks against science become more bitter and more widespread in the next few years, so long as the economic inequities in our society remain sharp and science continues to be predominantly engaged in building toys for the rich."[1]

"Are these just isolated events, or is something more going on?" asks Richard S. Nicholson in the editorial quoted above.[2]

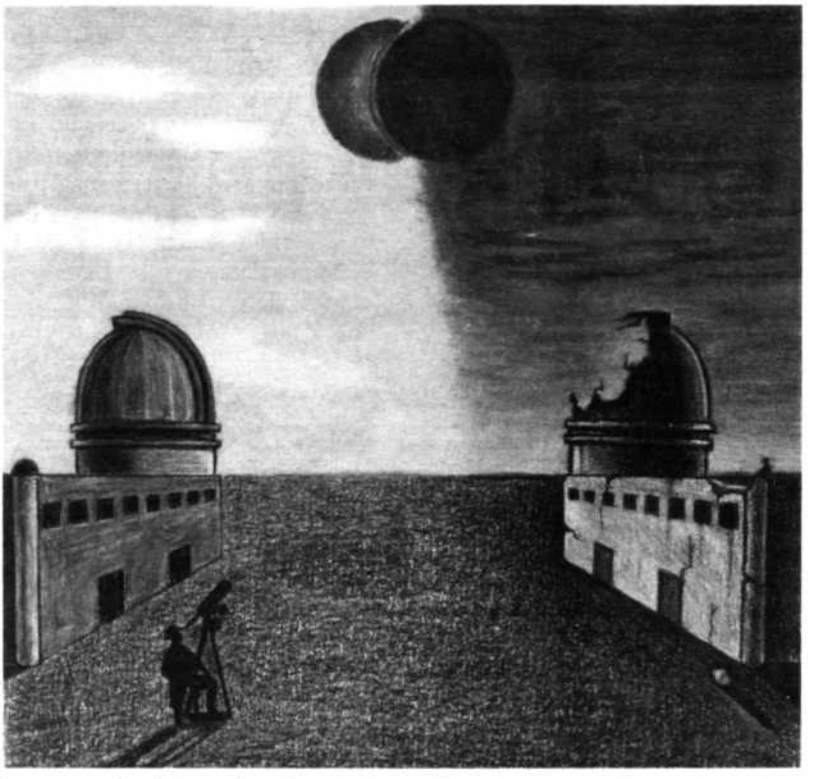
A further sign that science has lost considerable prestige is the recent rejection of the superconducting supercollider project by the U.S. Congress. Although the chief reason given was the need to cut the national deficit, one cannot help but feel that this decision reflects the diminishing level of public confidence in scientific research.

II

There have always been two cultures existing side by side, as Lord C. P. Snow (1959) has shown. There has been a historic debate between those who wish to advance scientific culture and those who claim that there are "two truths." According to the latter, there exists, along with cognitive scientific knowledge, a mystical and spiritual realm and/or aesthetic and subjective aspects of experience. The two cultures do not live side by side in peaceful coexistence any longer; in recent decades there have been overt radical attacks on science that threaten its position in society.

From within philosophy dissent has come from two influential areas. First, many philosophers of science, from Kuhn to Feyerabend, have argued that there is no such thing as scientific method, that scientific knowledge is relative to sociocultural institutions, that paradigm shifts occur for extrarational causes, and that therefore the earlier confidence that there are objective methods for testing scientific claims is mistaken.

This critique is obviously greatly exaggerated. It is true that science functions in relation to the social and cultural conditions in which it emerges, and it is true that we cannot make absolute statements in science. Nonetheless, there are reliable standards for testing claims and some criteria of objectivity, and these transcend specific social and cultural contexts. How does one explain the vast body of scientific knowledge we possess? A specific claim in science cannot be said to be the same as a poetic metaphor or a religious tenet, for it is tested by its experimental consequences in the real world.



The second philosophical attack comes from the disciples of Heidegger, especially the French postmodernists, such as Derrida, Foucault, Lacan, and Lyotard. They argue that science is only one mythic system or narrative among many others. They maintain that by deconstructing scientific language, we discover that there are no real standards of objectivity. Heidegger complained that science and technology were dehumanizing. Foucault pointed out that science is often dominated by power structures, bureaucracy, and the state, and that the political and economic uses of science have undermined the pretensions of scientific neutrality. Some of these criticisms are no doubt valid, but they are overstated. If the alternative to objectivity is subjectivity, and if there are no warranted claims to truth, then the views of the postmodernists cannot be said to be true either. Surely we can maintain that the principles of mechanics are reliable, that Mars is a planet that orbits the sun, that cardiovascular diseases can be explained causally and preventive measures taken to lower the risk, that the structure of DNA is not simply a social artifact, nor insulin a cultural creation.

The postmodern critics of "modernity" are objecting to the rationalist or foundationalist interpretations of science that emerged in the sixteenth and seventeenth centuries, and perhaps rightly so. For the continuous growth and revision of scientific theories demonstrates that any "quest for certainty" or "ultimate first principles" within science is mistaken. Nonetheless, they go too far in abandoning the entire modern scientific enterprise. The scientific approach to understanding nature and human life has been vindicated by its success; and its premises, I submit, are still valid. What are some of the characteristics of this modern scientific outlook as it has evolved today?

First, science presupposes that there *are* objective methods by which reliable knowledge can be tested. Second, this means that hypotheses and theories can be formulated and that they can be warranted (*a*) by reference to the evidence, (*b*) by criteria of rational coherence, and (*c*) by their predicted experimental consequences. Third, modern scientists find that mathematical quantification is a powerful tool in establishing theories. Fourth, they hold that there are causal regularities and relationships in our interactions with nature that can be discovered. Fifth, although knowledge may not be universal, it is general in the sense that it goes beyond mere subjective or cultural relativity and is rooted in an intersubjective and intercultural community of inquirers. Sixth, as the progressive and fallible character of science is understood, it is seen that it is difficult to reach absolute or final statements, that science is tentative and probabilistic, and that scientific inquiry needs to be open to alternative explanations. Previous theories are therefore amenable to challenge and revision, and selective and constructive skepticism is an essential element in the scientific outlook. Seventh is the appreciation of the fact that knowledge of the probable causes of phenomena as discovered by scientific research can be applied, that powerful technological inventions can be discovered, and that these can be of enormous benefit to human beings.

III

Yet the scientific approach, which has had such powerful effectiveness in extending the frontiers of knowledge, is now under heavy attack. Of special concern has been the dramatic growth of the occult, the paranormal, and pseudosciences, and particularly the promotion of the irrational and sensational in these areas by the mass media. We allegedly have been living in the New Age. Side by side with astronomy there has been a return to astrology, and concomitant with psychology there was the growth of psychical research and parapsychology. The paranormal imagination soars; science fiction has no bounds. This is the age of space travel, and it includes abductions by extraterrestrial beings and unidentified flying objects from other worlds. The emergence of a paranormal worldview competes with the scientific worldview. Instead of tested causal explanations, the pseudosciences provide alternative explanations that compete in the public mind with genuine science. The huge increase in paranormal beliefs is symptomatic of a profound antiscience attitude, which has not emerged in isolation but is part of a wider spectrum of attitudes and beliefs.

The readers of the SKEPTICAL INQUIRER are no doubt familiar with the singular role of CSICOP in evaluating claims made about the paranormal and by fringe sciences. Our basic aim is to contribute to the public appreciation for scientific inquiry, critical thinking, and science education. We need to be equally concerned, I submit, about the growth of antiscience in general.

The most vitriolic attacks on science in recent decades have questioned its benefits to society. To a significant extent these criticisms are based on ethical considerations, for they question the value of scientific research and the scientific outlook to humankind. Here are 10 categories of such objections. There are no doubt others.[3]

1. After World War II great anxiety arose about a possible nuclear holocaust. This fear is not without foundation; for there is some danger of fallout from nuclear accidents and testing in the atmosphere, and there is the threat that political or military

leaders might embark, consciously or accidentally, upon a devastating nuclear war. Fortunately, for the moment the danger of a thermonuclear holocaust has abated, though it surely has not disappeared. However, such critiques generated the fear of scientific research, and even, in some quarters, the view that physicists were diabolical beings who, in tinkering with the secrets of nature, held within their grasp the power to destroy all forms of life on this planet. The fear of nuclear radiation also applies to nuclear power plants. The accident at Chernobyl magnified the apprehension of large sectors of the world's population that nuclear energy is dangerous and that nuclear power plants should be closed down. In countries like the United States, no nuclear power plants are being built, although France and many other countries continue to construct them. The nuclear age has thus provoked an antinuclear reaction, and the beneficent symbol of the scientist of the past, Albert Einstein, has to some been transmogrified into a Dr. Strangelove. Although some of the apprehensions about nuclear radiation are no doubt warranted, to abandon nuclear fuel entirely, while the burning of fossil fuels pollutes the atmosphere, leaves few alternatives for satisfying the energy needs of the world. This does not deny the need to find renewable resources, such as solar and wind power, but will these be sufficient?

2. The fear of science can also be traced to some excesses of the environmental movement. Although the environmentalists' emphasis on ecological preservation is a valid concern, it has led at times to the fear that human technology has irreparably destroyed the ozone layer and that the greenhouse effect will lead to the degradation of the entire planet. Such fears often lead to hysteria about all technologies.

"It is true that we cannot make absolute statements in science. Nonetheless, there are reliable standards for testing claims and some criteria of objectivity, and these transcend specific social and cultural contexts."

3. In large sectors of the population, there is a phobia about any kind of chemical additive. From the 1930s to the 1950s, it was widely held that "better things and better living can be achieved through chemistry" and that chemicals would improve the human condition. Today there is, on the contrary, a widespread toxic terror—of PCBs and DDT, plastics and fertilizers, indeed of *any* kind of additive—and there is a worldwide movement calling for a return to nature, to organic foods and natural methods. No doubt we need to be cautious about untested chemical additives that may poison the ecosystem, but we should not forget that the skilled use of fertilizers led to the green revolution and a dramatic increase in food production that reduced famine and poverty worldwide.

4. Suspicion of biogenetic engineering is another dimension of the growth of antiscience. From its very inception biogenetic research has met opposition. Many feared that scientists would unleash a new, virulent strain of *E. coli* bacteria into sewer pipes—and then throughout the ecosystem—that would kill large numbers of people. Jeremy Rifkin (Rifkin 1991, 1990; Howard and Rifkin 1977) and others have demanded that all forms of biogenetic engineering research be banned because of its

"dehumanizing" effect. A good illustration of this can be seen in the film *Jurassic Park*, produced by Steven Spielberg. Here not only does a Dr. Frankenstein seek to bring back the dead, but we are warned that a new diabolical scientist, in cloning dinosaurs, will unleash ominous forces across the planet. Although there may be some dangers in biogenetic engineering, it offers tremendous potential benefit for humankind—for the cure of genetic diseases as well as the creation of new products. Witness, for example, the production of synthetic insulin.

5. Another illustration of the growth of antiscience is the widespread attack on orthodox medicine. Some of these criticisms have some merit. With the advances of the scientific revolution and the growth of medical technology, we have been able to extend human life, yet many people are kept alive against their will and suffer excruciating pain; and the right to die has emerged as a basic ethical concern. Medical ethicists have correctly pointed out that the rights of patients have often been ignored by the medical and legal professions. In the past physicians were considered authoritarian figures, whose wisdom and skills were unquestioned. But to many vociferous critics today, doctors are demons rather than saviors. The widespread revolt against animal research is symptomatic of the attack on science. Granted that animals should not be abused or made to suffer unnecessary pain, but some animal rights advocates would ban all medical research on animals.

6. Another illustration of antiscience is the growing opposition to psychiatry. Thomas Szasz (1984; 1977) has no doubt played a key role here. As a result of his works, large numbers of mental patients were deinstitutionalized. *One Flew Over the Cuckoo's Nest*, by Ken Kesey (1962), dramatizes the view that it is often the psychiatrist himself who is disturbed rather than the patient. Many, like Szasz, even deny that there are mental illnesses, though there seems to be considerable evidence that some patients do suffer behavioral disorders and exhibit symptoms that can be alleviated by anti-psychotic drugs.

7. Concomitant with the undermining of public confidence in the practice of medicine and psychiatry has been the phenomenal growth in "alternative health cures," from faith healing and Christian Science to the relaxation response, iridology, homeopathy, and herbal medicines. This is paradoxical, because medical science has made heroic progress in the conquering of disease and the development of antibiotics and the highly successful techniques of surgical intervention. These have all been a boon to human health. But now the very viability of medical science itself has been questioned.

8. Another area of concern is the impact of Asian mysticism, particularly since World War II, whereby Yoga meditation, Chinese Qigong, gurus, and spiritualists have come into the Western world arguing that these ancient forms of knowledge and therapy can lead to spiritual growth and health in a way that modern medicine does not. Unfortunately, there are very few reliable clinical tests of these so-called spiritual cures. What we have are largely anecdotal accounts, but they hardly serve as objective tests of alternative therapies.

9. Another form of antiscience is the revival of fundamentalist religion even within advanced scientific and educational societies. Fundamentalists question the very foundation of scientific culture. Indeed, in the modern world, it is religion, not science, that seems to have emerged as the hope

"Unless the scientific community and those connected with it are willing to take the challenge to science seriously, then I fear that the tide of antiscience may continue to rise"

of humankind. Far more money is being poured into religion than into scientific research and education. Especially symptomatic is the continued growth of "scientific creationism" and widespread political opposition to the teaching of evolution in the schools, particularly in the United States.

10. A final area of antiscience is the growth of multicultural and feminist critiques of science education, particularly in the universities and colleges. The multiculturist view is that science is not universal or transcultural, but relative to the culture in which it emerges. There are, we are told, non-Western and primitive cultures that are as "true" and "valid" as the scientific culture of the Western world. This movement supports the complete relativization of scientific knowledge. The radical feminist indictment of "masculine bias" in science maintains that science has been the expression of "dead, white Anglo-Saxon males"—from Newton to Faraday, from Laplace to Heisenberg. What we must do, the extremists of these movements advise, is liberate humanity from cultural, racist, and sexist expressions of knowledge, and this means scientific objectivity as well. The positive contribution of these movements, of course, is that they seek to open science to more women and minorities. The negative dimension is that multiculturalist demands on education tend to weaken an understanding of the rigorous intellectual standards essential for effective scientific inquiry. Clearly we need to appreciate the scientific contribution of many cultures and the role of women in science throughout history; on the other hand, some multicultural critics undermine the very possibility of objective science.

IV

What I have presented is a kaleidoscope illustration of many current trends that are undermining and threaten the future growth of science. They raise many questions. Why has this occurred? How shall those who believe in the value of scientific methods and the scientific outlook respond?

This is a complex problem, and I can only suggest some possible solutions. But unless the scientific community and those connected with it are willing to take the challenge to science seriously, then I fear that the tide of antiscience may continue to rise. Scientific research surely will not be rejected where there are obvious technological uses to be derived from it, at least insofar as economic, political, and military institutions find these profitable. But the decline in the appreciation of the methods of science and in the scientific outlook can only have deleterious effects upon the long-term role of science in civilization.

One reason for the growth of antiscience is a basic failure to educate the public about the nature of science itself. Of crucial significance is the need for public education in the aims of science. We need to develop an appreciation of the general methods of scientific inquiry, its relationship to

skepticism and critical thinking, and its demand for evidence and reason in testing claims to truth. The most difficult task we face is to develop an awareness that the methods of science should not only be used in the narrow domains of the specialized sciences, but should also be generalized, as far as possible, to other fields of human interest.

We also need to develop an appreciation for the cosmic outlook of science. Using the techniques of scientific inquiry, scientists have developed theories and generalizations about the universe and the human species. These theories often conflict with theological viewpoints that for the most part go unchallenged. They also often run counter to mystical, romantic, and aesthetic attitudes. Thus it is time for more scientists and interpreters of science to come forward to explain what science tells us about the universe: for example, they should demonstrate the evidence for evolution and point out that creationism does not account for the fossil record; that the evidence points to a biological basis for the mind and that there is no evidence for reincarnation or immortality. Until the scientific community is willing to explicate openly and defend what science tells us about life and the universe, then I fear it will continue to be undermined by the vast ignorance of those who oppose it.

In this process of education, what is crucial is the development of scientific literacy in the schools and in the communications media. Recent polls have indicated that a very small percentage of the U.S. population has any understanding of scientific principles. The figures are similar for Britain, France, and Germany, where large sectors of the population are abysmally unaware of the nature of the scientific outlook. Thus we need to educate the public about how science works and what it tells us about the world, and we should make sure this understanding is applied to all fields of human knowledge.

The growth of specialization has made this task enormously difficult. Specialization has enabled people to focus on one field, to pour their creative talents into solving specific problems, whether in biology or physics, mathematics or economics. But we need to develop generalists as well as specialists. Much of the fear and opposition to science is due to a failure to understand the nature of scientific inquiry. This understanding should include an appreciation for what we know and do *not* know. This means not only an appreciation of the body of reliable knowledge we now possess, but also an appreciation of the skeptical outlook and attitude. The interpreters of science must go beyond specialization to the general explication of what science tells us about the universe and our place in it. This is unsettling to many within society. In one sense, science is the most radical force in the modern world, because scientists need to be prepared to question everything and to demand verification or validation of any claims.

The broader public welcomes scientific innovation. Every new gadget or product and every new application in technology, where it is positive, is appreciated for its economic and social value. What is not appreciated is the nature of the scientific enterprise itself and the need to extend the critical methods of science further, especially to ethics, politics, and religion. Until those in the scientific community have sufficient courage to extend the methods of science and reason as far as they can to these other fields, then I feel that the growth of antiscience will continue.

Now it is not simply the task of scientists who work in the laboratory, who have a social responsibility to the greater society; it is also the task of philosophers, journalists, and those within the corporate and the political world who appreciate the contribution of science to humankind. For what is at stake in a sense is modernism itself. Unless corporate executives and those who wield political power recognize the central role that science and technology have played in the past four centuries, and can continue to play in the future, and unless science is defended, then I fear that the irrational growth of antiscience may undermine the viability of scientific research and the contributions of science in the future. The key is education—education within the schools, but education also within the media. We need to raise the level of appreciation, not simply among students, from grammar school through the university, but among those who control the mass media. and here, alas, the scientific outlook is often overwhelmed by violence, lurid sex, the paranormal, and religious bias.

The world today is a battlefield of ideas. In this context the partisans of science need to defend courageously the authentic role that science has played and can continue to play in human civilization. The growth of antiscience must be countered by a concomitant growth in advocacy of the virtues of science. Scientists are surely not infallible; they make mistakes. But the invaluable contributions of science need to be reiterated. We need public *re-enchantment* with the ideals expressed by the scientific outlook.

Notes

1. Dyson's comments have now been published in his essay in the Fall 1993 *American Scholar*.

2. For a useful overview, see the new book by Gerald Holton, *Science and Anti-Science* (Cambridge, Mass.: Harvard University Press, 1993).

3. For an extreme case of antiscience paranoia, see David Ehrenfeld's *The Arrogance of Humanism* (New York: Oxford University Press, 1975), where the author virtually equates humanism with science and modernism.

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Paul Kurtz, professor emeritus of philosophy at the State University of New York at Buffalo, is the founding chairman of CSICOP.

The Antiscience Problem

GERALD HOLTON

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Opposition to science as conventionally defined can take a great variety of forms, from interest in astrology to attacks on relativity theory, from false beliefs based on scientific illiteracy to support of Lysenkoism or Creationism. Which of these attacks are relatively negligible, and which are dangerous? What do these symptoms of disaffection with the Enlightenment-based tradition portend for science and culture in our time? Once we have a framework to deal with the belief in antiscience (or "alternative science," "parascience"), we shall recognize that such belief is grounded in a person's functional worldview; it is one symptom of a long-standing struggle over the legitimacy of the authority of conventional science, as well as of the concept of modernity within which science claims to be embedded.

* * *

The term *antiscience* can lump together too many, quite different things that have in common only that they tend to annoy or threaten those who regard themselves as more enlightened. We must disaggregate from the disparate jumble that which is the truly worrisome part of antiscience, so that we can discriminate between "real" science (good, bad, and indifferent; old, new, or just emerging); pathological science (as in Irving Langmuir's essay on people who thought they were doing real science but were misled); pseudoscience (astrology and the "science" of the paranormal); blatant silliness and superstition ("pyramid power"); scientism (the overenthusiastic importation of "scientific" models into nonscientific fields; or the vastly exaggerated claims of technocrats for scientific and technological powers, such as the "Star Wars" projects); and other forms.

* * *

Yet, if our aim is to filter out, name, and analyze the really dangerous segment of what some call the "antiscience movement," we shall not find much help in the literature. There exists no adequate, serious treatment of it, nor even of the modern outlook that feels threatened by antiscience. All of us enter this study equally in need of a better understanding.

* * *

In a democracy, no matter how poorly informed the citizens are, they do properly demand a place at the table

where decisions are made, even when those decisions have a large scientific/technical component. In that lies the potential for erroneous policy and eventual social instability. For as I shall illustrate, history has shown repeatedly that a disaffection with science and its view of the world can turn into a rage that links up with far more sinister movements.

It is thoughts of this kind that the phenomenon of antiscience raises in the minds of many intellectuals, West and East. By themselves, all the astrologers, anti-evolutionists, spiritualists, psychics, and peddlers of New Age thinking could otherwise be merely a target of our condescension or a source of amusement. We seem to discern behind these multi-faceted phenomena—and the related illiteracy in history, geography, etc., which we shall cover for now with the delicacy of embarrassed silence—something perilous, a potentially fatal flaw in the self-conception of the people today.

* * *

The "pro-science"-imbued world picture of the late twentieth century is a rather vulnerable and fragile minority position, the more so as scientists and other intellectuals as a group have not managed to create sufficient effective institutional or other intellectual forums for even discussing among themselves, and with others, what the powers and limits of science in these respects are.

* * *

Perhaps the most basic aspect of the scientific method is that despite all personal passion and ecstasy in the doing of it, the results are to be completely invariant with respect to private longings or individual differences. . . . The tolerance of impersonality is at the very heart of conventional science; but it is anathema from the point of view of parascience, with its celebratory focus on the personal, its introduction of "consciousness" even into the atom, and other quasi-animistic beliefs.

* * *

History records an important and revealing asymmetry: the original Machine Luddites of the nineteenth century were soon brutally crushed; but the Cultural Luddites have often, at least for some time, been the winners, although at great cost to their civilization. It is sobering that in every case there were intellectuals who tried to stand up to the Cultural Luddites—but they rose too late, were far too small in number, received little encouragement from their peers, and had less commitment and staying power than did their opponents.

History records that the serious and dedicated portion of the antiscience phenomenon, when married to political power, does signal a major cultural challenge. At its current level, this challenge may not be an irreparable threat to the modern worldview as such. But it cannot be dismissed as just a distasteful annoyance either, nor only as a reminder of the failure of educators. On the contrary, the record from Ancient Greece to Fascist Germany and Stalin's U.S.S.R. to our day shows that movements to delegitimate conventional science are ever present and ready to put themselves at the service of other forces that wish to bend the course of civilization their way—for example, by the glorification of populism, folk belief, and violence, by mystification, and by an ideology that arouses rabid ethnic and nationalistic passions. . . . □

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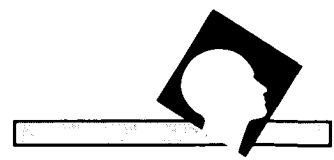
Measuring the Prevalence of False Memories

A New Interpretation of a 'UFO Abduction Survey'

TED G. GOERTZEL

Budd Hopkins, David Jacobs, and Ron Westrum's (1992) assertion, in *Unusual Personal Experiences*, that 3.7 million Americans are suffering from "UFO abduction syndrome" has been criticized for methodological and logical deficiencies (Stires 1993; Klass 1993; Hall, Rodeghier, and Johnson 1993; Dawes and Mulford 1993). In an attempt to remedy these deficiencies, my research-methods class at Rutgers University undertook to replicate Hopkins, Jacobs, and Westrum's survey. Our questionnaire included the items that the authors believed were indicators of UFO abduction, but added others that were designed to place their items in a broader psychological context.



A replication of items from a 'UFO abduction survey' shows that it actually could be a useful measure of the prevalence of false memories in the American population.

In March and April 1993, we conducted interviews with 697 residents of southwestern New Jersey. Our sample was partly random and partly accidental. We began with telephone interviews of randomly selected telephone subscribers, but it proved too difficult for the students to obtain an adequate sample in that way, so we relaxed the sampling plan to allow the students to include their friends and family members. This kind of accidental sampling is not appropriate for generalizing to a population at large, but it is generally viewed as adequate for testing the validity and reliability of a measure. There is no reason to believe that systematic sampling biases were introduced that would have distorted the correlations between questionnaire items.

Despite the use of accidental sampling, the

TABLE 1

Experience	National Sample	South Jersey Sample
1. "Waking up paralyzed with a sense of a strange person or presence or something else in the room."	18%	25%
2. "Experiencing a period of time of an hour or more, in which you were apparently lost, but you could not remember why or where you had been."	13%	17%
3. "Feeling that you were actually flying through the air although you didn't know why or how."	10%	12%
4. "Seeing unusual lights or balls of light in a room without knowing what was causing them."	8%	13%
5. "Finding puzzling scars on your body and neither you nor anyone else remembering how you received them or where you got them."	8%	18%
"Abductee": Having four or five of the above experiences.	2%	3.4%

frequency of "unusual personal experiences' in our sample was close to that obtained from Hopkins, Jacobs, and Westrum's representative national sample. Table 1 gives the percentages from both samples for the five experiences Hopkins, Jacobs, and Westrum used as their measure of UFO-abduction status. By their criteria—of having suffered four or five of these experiences—3.4 percent of our respondents qualified as "abductees." This number is quite high, especially considering the fact that the interviews were done in the suburbs of Philadelphia, an urban region not known for a high frequency of UFO sightings or abduction reports.

Hall, Rodeghier, and Johnson (1993: 132) note that Hopkins, Jacobs, and Westrum "apparently did not assess the reliability of this measure by using the customary formulas based on internal consistency, though it would be quite simple to do so." We applied these formulas to our data and achieved a reliability coefficient of .68 (coefficient alpha) for the abduction scale, which is quite acceptable for a five-item scale. This and other standard psychometric analyses we conducted suggest that the scale is measuring a consistent phenomenon of some kind, but it tells us nothing about *what* it is that the scale is measuring.

Assessing the *validity* of a measure is much more difficult and is really the crux of the issue. By validity, we simply mean whether the measure measures what it is supposed to measure, in this case UFO abductions. The best method (known as "criterion validity") is to correlate the measure with a known outcome measure. Thus, a measure of "scholastic ability" can be validated if it correlates with school performance (other things being equal). This method cannot be used in this case, however, since we have no generally accepted measure of abduction status. The only viable alternative is to examine the measure's "construct validity." This means examining whether the measure performs as the theory predicts.

TABLE 2
Survey Items Correlated with "UFO-Indicator" Experiences

Items	Correlation
6. "Feeling as if you left your body."	.30
7. "Having seen, either as a child or as an adult, a terrifying figure—which might have been a monster, a witch, a devil, or some other evil figure in your bedroom, closet or somewhere else."	.38
8. "Seeing a ghost."	.26
9. "Seeing a UFO."	.21
10. "Having vivid dreams about UFOs."	.16
11. "Having a sudden feeling that something bad was happening to someone you know, and later finding out that you were correct."	.37
12. "Seeing a halo or ring of light around another person which other people couldn't see."	.23
13. "Being visited by a deceased relative or friend who spoke to you by name."	.31

In this case, there are at least two alternative theories that can explain why the measure is internally consistent. One is that the respondents are consistently reporting on experiences similar to those of UFO abductees. The other is that the individuals who score high on the scale share a psychological tendency to have false memories. Theodore Flournoy (1911) referred to this phenomenon as *cryptomnesia*. Psychologist Robert Baker (1992: 78) states that this phenomenon of "seeing complex visual images in one's head that you cannot remember ever having seen before or . . . suddenly hearing voices from unknown and unrecollected sources is not only a much more common occurrence than is generally known but is also one of the more interesting and intriguing anomalies in the field of 'normal' human behavior."

To distinguish between these two theories, we included three items in our questionnaire about "unusual personal experiences" that are *not* part of the "UFO abduction" syndrome as posited by Hopkins, Jacobs, and Westrum. These three items are numbers 11, 12, and 13 in Table 2. As Table 2 shows, these items correlated (Pearson's *r*) with the "UFO abduction" measure as well as with the other items from Hopkins, Jacobs, and Westrum's study that are also included in Table 2. Three of Hopkins, Jacobs, and Westrum's items (numbers 6, 7, and 8) actually say nothing about UFOs, but can better be thought of as tapping a cryptomnesiac tendency to have "psychic" or "New Age" experiences (Ring 1992). If all these 13 items are combined in a single scale, we obtain a reliability coefficient of .75.

We used a statistical technique known as "factor analysis" to analyze how the responses to the 13 items grouped together empirically. The factor analysis found that a single factor accounts for the consistency of the measure. There is no empirical basis for separating the "UFO" items from the items that do not relate to the abduction phenomenon. Table 3

"Only a strong belief in the prevalence of the abduction phenomenon led the researchers to interpret questions about seeing ghosts or having out-of-body experiences as indicators of abduction."

TABLE 3

Item Number	Factor Loadings
1	.58
2	.50
3	.47
4	.57
5	.42
6	.49
7	.59
8	.58
9	.33
10	.32
11	.60
12	.43
13	.55

shows the loadings on this principal factor. The loadings measure how well each item correlated with the general factor the group of items have in common. As the table shows, the three non-UFO-related items (11, 12, and 13) fitted right in with the other items, which were intended to measure UFO-abduction experiences. An attempt to divide these items into groupings through a technique known as "rotating the factors" was not successful. The only items that clustered together were "seeing a UFO" and "having vivid dreams about UFOs," which are obviously similar. If we treat these two items as belonging to a separate factor, the item most closely related to them is "seeing a ghost." The factor analysis strongly supports the view that these 13 items are a measure of cryptomnesia, not of UFO abduction. We will henceforth refer to them as the *cryptomnesia scale.*

This conclusion is also strongly supported by Dawes and Mulford's (1993) innovative study at the University of Oregon. This study demonstrated that the dual nature of Hopkins, Jacobs, and Westrum's first item, which asked about "waking up paralyzed" *and* about sensing a strange person in the room in the *same* item, actually led to an *increased* recollection of unusual phenomena as compared to a properly constructed single-issue survey item. Textbooks on questionnaire writing universally warn against "double-barreled" questions of this sort because they are known to give bad results. Dawes and Mulford confirm this and further offer the explanation that the combination of the two issues in one item causes a conjunction effect in memory that increases the likelihood of false recollection.

While the Hopkins, Jacobs, and Westrum scale is not a valid measure of UFO abduction, its developers have inadvertently constructed a useful measure of another phenomenon: the tendency to have false memories. Therefore, we will henceforth refer to this measure as the "cryptomnesia scale." Further support for this interpretation can be obtained by correlating the cryptomnesia scale with other

TABLE 4
Items Correlated with a High Frequency of "Unusual Personal Experiences" (Cryptomnesia)

Items	Correlation
14. "High government officials were involved in the Kennedy assassination."	.21
15. "The AIDS virus was created deliberately as part of a conspiracy against certain groups in our society."	.15
16. "The Air Force is hiding evidence that the United States has been visited by flying saucers."	.20
17. "I believe in astrology."	.16
18. "I can usually trust my neighbors."	-.16
19. "I can usually trust my relatives."	-.15
20. "When I was growing up, I could usually trust my parents."	-.12
21. "I often wake up in the middle of the night worrying about things."	.16
22. "I sometimes feel that people are conspiring against me."	.22
23. "I sometimes find it difficult to deal with all the stress in my life."	.16
24. "I enjoy reading books about UFOs and other strange phenomena."	.22

items in the questionnaire. To the extent that the scale behaves as Baker's theory would predict, we can be more confident of its validity as a measure of cryptomnesia. Table 4 shows correlations between cryptomnesia and a number of other questionnaire items. All the correlations reported in this study are statistically significant ($p < .05$).

The first three items show that high scores on the cryptomnesia scale are related to belief in conspiracies, including the JFK assassination and AIDS conspiracies, as well as the UFO cover-up conspiracy. Cryptomnesiacs are also more likely to believe in astrology and less likely to trust their neighbors, relatives, and parents. They are more likely to have difficulty dealing with the stress in their lives, to wake up with worries at night, and to feel that people are conspiring against them. They are more likely to enjoy reading about UFOs and other strange phenomena. We did not, however, obtain significant correlations with items measuring anomie (a personal lack of purpose or ideals, or a feeling of not really belonging to society).

Many of these findings are not surprising. David Jacobs (1992) has noted high stress levels and frequency of psychosomatic symptoms among "UFO abductees," which he attributes to the trauma of the abduction experience. The question here is one of distinguishing cause from effect—do the abductions cause stress, or does the stress cause the false memories, which are interpreted as abductions under hypnosis? It is difficult to resolve this kind of cause-and-effect issue with data gathered at one point in time. Since our analysis suggests that we are dealing with cryptomnesia, not UFO abduction, however, we undertook a causal path analysis based on the assumption that this is

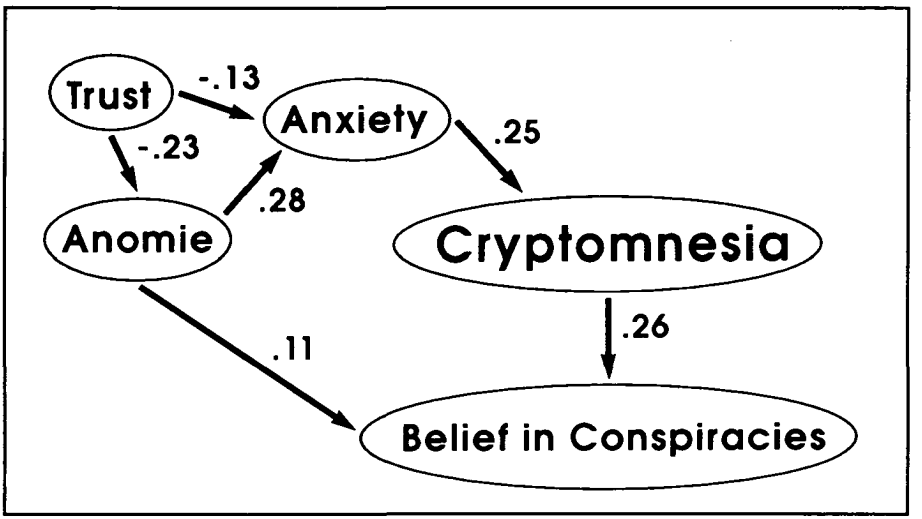


FIGURE 1

a psychological phenomenon rooted in early life experiences. The results of this analysis are summarized in the path diagram (Figure 1).

The path analysis suggests that cryptomnesia is rooted in a lack of trusting relationships. This problem may have its origins in early childhood, but it continues into adult life with a lessened feeling of trust of friends and neighbors. This lack of trust leads to feelings of anomie and anxiety that make the individual more likely to construct false memories out of information stored in the unconscious mind. People who think in this way are susceptible to belief in conspiracy theories, since these theories help them to make sense of an otherwise incoherent world.

This causal analysis is consistent with our data, but certainly not proved by it. Path analysis is not a substitute for in-depth psychological case studies. The path coefficients are modest in size, probably because most of the variables were measured with brief three-item scales because of the need to keep the questionnaire brief. This analysis does, however, provide a more plausible interpretation of the data than does the UFO-abduction hypothesis. It is also consistent with the results of detailed psychological testing on "abductees" (Slater 1985; Klass 1989).

David Jacobs was kind enough to speak to our class to familiarize the students with the issue, and I had the opportunity to speak with him informally after the lecture. At that time, I mentioned the "UFO abduction" case discussed in Siegel's (1992) book *Fire in the Brain*. Jacobs was not interested in learning of Siegel's findings and expressed the view that no one was qualified to speak on this issue unless they had done dozens of interviews with abductees under hypnosis, as he had. He clearly fit the profile of the true believer as described in my book *Turncoats and True Believers* (Goertzel 1992). He used numerous ideological defense mechanisms to avoid confronting unwelcome evidence.

The UFO-abduction survey data promise some relief from this subjectivity, thanks to the objectivity of

random sampling and statistical analysis. However, even when the data are collected and reported accurately as they apparently were in this case, the biases of the investigator can enter into the interpretation. In this case, only a strong belief in the prevalence of the abduction phenomenon led the researchers to interpret questions about seeing ghosts or having out-of-body experiences as indicators of abduction. Our data show that there is no objective basis for that assumption. The observed correlations are part of a broader psychological syndrome that includes non-UFO-related phenomena.

Of course none of this proves that UFO abductions have not occurred in a small number of cases. In fact, two of our respondents volunteered that they had experienced such events. (We made no attempt to verify their accounts.) However, the public can rest assured that there is no evidence that millions of Americans are being abducted. Further research on the psychological phenomenon of cryptomnesia, however, is warranted. Both our survey and Hopkins, Jacobs, and Westrum's representative national sample suggest that it is an identifiable syndrome affecting several million people in American society.

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Bleuler's Views on Inheritance of Acquired Characteristics and on Psi Phenomena

GEORGE WINDHOLZ

From the late 1920s on, the famous Swiss psychiatrist Eugen Bleuler (1857-1939) staunchly propagated the reality of the inheritance of acquired characteristics and the existence of parapsychological phenomena. As Bleuler was considered an outstanding scholar, his views could not be ignored. He was a popular speaker, attracting large audiences; the Swiss newspaper *Neue Zürcher Zeitung* reported that on January 19, 1927, when Bleuler spoke on "The Problems of Occultism," the university auditorium was so overfilled that there was apprehension that the audience's safety was in jeopardy.

Bleuler was then the foremost authority on schizophrenias, and, as his writings in psychiatry show, he was a rational scientist. What factors, therefore, inclined him toward pseudoscience? It seems that when Bleuler read materials that failed to support his notions, his sound judgment was suspended, and he spent considerable time and effort to refute such views; the somber, rational scientist transformed himself into a bitter, sarcastic critic. Bleuler thus joins the long list of prominent scientists, such as William Crookes, Alfred Russel Wallace, J. C. F. Zoellner, and Sir Oliver Lodge, who risked their reputations by investigating and endorsing the reality of various psychical phenomena (Hyman 1989).

I will attempt to explain the reasons for Bleuler's insistence on the reality of the inheritance of acquired characteristics and of the

The famous Swiss psychiatrist Eugen Bleuler advocated pseudoscientific views during the last years of his life. The apparent reason was to continue to contribute to science after his retirement, when he lost access to schizophrenic subjects he had studied during his professional career.

occult. The explanations are only the initial step in hypothesis formation and must be considered tentative. But first let us consider Bleuler's record as scholar and psychiatrist.

From 1898 to 1927, Bleuler was the director of Burghölzli, the psychiatric clinic of the University of Zürich. The directorship carried with it the professorship in psychiatry at the university. Bleuler's *Lehrbuch der Psychiatrie* (Textbook of psychiatry) was popular; it appeared from 1916 to 1937 in six German- and four English-language editions. Bleuler was rigorous in scientific matters; early in his career, in the 1870s, he performed physiological experiments at the University of Zürich (Gaupp 1940; Minkowski 1941). In a 1919 monograph, titled *Das Autistisch-Undisziplinierte Denken in der Medizin und seine Überwindung*, he exhorted physicians and researchers to beware of *autistic* thinking that "does not seek truth, but the fulfillment of wishes" (Bleuler 1919:1).

Bleuler's seminal contribution to psychiatry—the concept of *schizophrenias*—was derived from observing the behavior of institutionalized patients. He proposed that schizophrenias may emerge at any period in an individual's life and does not have to end in dementia. This meant that some schizophrenic patients may recover—an optimistic conclusion that was at variance with the commonly held view that there was no remission in schizophrenias (Gaupp 1940).

After Bleuler retired in 1927, he worked on a project that had claimed his attention for many years: the construction of a theory of psychology that he called "mnemistic biopsychology" and described in numerous books and articles published in the 1920s and 1930s. I will describe here only the most salient aspects of Bleuler's (1932) theory.

Life depends on the organism's adaptation; to survive, it must deal with the environment. Adaptation to the changing external environment is the function of the central nervous system, primarily the brain. According to Bleuler, one fundamental process of the brain is the *mneme*, which is both the conscious and unconscious memory.

The individual's mneme has a function, he said; it furthers survival. To survive, the organism adapts. The adaptive responses modify the mneme. The mneme is thus a repository of information. This information makes it easier for the organism to adapt to similar environmental situations in the future.

The mneme receives information by the associative process, he said, but this information forms integrated totalities or configurations—the engrams. *Engrams* were said to be configurations of specific incidents that were experienced by the organism in the past and serve as guides in similar present or future situations. Everything that an individual experiences is fixated in terms of engrams. The mneme consists of many different engrams (Bleuler 1932).

In contrast to the mneme, *instincts* are not acquired by the individual but are the innate characteristics of a species. Instincts, however, further the individual's adaptation. How can it be that instincts have adaptive properties? The answer is that adaptation acquired by the individual's mneme becomes the property of the instincts, or, in Bleuler's words: "the acquisition by the mneme can be transferred to the next generations" (Bleuler 1933:102). With this argument, Bleuler ventured that acquired characteristics are inherited.

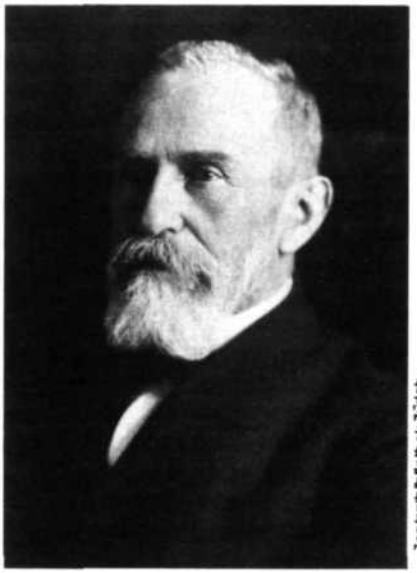
Bleuler defended his thesis of the inheritance of acquired characteristics in a 1925 book titled *Die Psychoide als Prinzip der organischen Entwicklung* and

in a paper published in 1934. In the book, Bleuler declared his support of Charles Darwin's theory of evolution, yet he asserted that it required modification. Bleuler maintained that Darwin's random variations and natural selection are valid concepts but alone could not explain evolution. Darwin himself thought the concept of struggle for existence insufficient in explaining evolutionary change and therefore proposed the inheritance of acquired characteristics through "gemmules" (cf. Ruse 1979). Bleuler discarded Darwin's gemmules, proposing instead the concept of mneme in explaining the inheritance of acquired characteristics.

Bleuler (1925) stated that random variations cannot account for the entire mechanism of evolution because the probability of adaptation as the product of chance alone is minimal. For instance, consider the formation of the animal eye. As the functioning eye consists of six parameters (retina, transparent skin, lid, etc.), Bleuler figured out that the probability of simultaneous occurrence of three parameters was at least:

$$1/131072 \times 10^{-40}$$

He said this probability is far too low to be accepted as likely in the formation of the eye. Nor was Bleuler willing to consider experiments in which some body part was damaged in successive generations and no change was observed in the subsequent ones. Bleuler referred to Weismann's experiment where the tails of more than 20 generations of mice were cut off, with no diminution in the length of the tails in subsequent generations. Anyway, he argued, it was a poor experiment for we should not have expected any experimental results; it is known that after cutting grapes for thousands of years, grapes still continue to sprout.



Eugen Bleuler, one of the leading psychiatrists of his time.

Evolution occurs, according to Bleuler (1925), because ontogenic changes become an aspect of the mneme, or, more specifically, of engrams. The engram is not modified alone; the adaptive processes provide relevant information to the entire organism. This can be seen in biological regeneration; as soon as the organism's body is damaged, the organism's nervous system receives the information and reacts to restore the damaged part. The restorative work is not random; it is directed according to the principle of psychoide. *Psychoide* is the organizing principle of the mneme; it provides the "blueprint" that makes the functioning of the organism possible.

Information resulting from some adaptive action, in his view, is received by the engram. He said the gene is itself an engram. The gene becomes modified and organized by psychoide. The adaptive, ontogenic experiences that affect the gene in a series of generations are passed on phylogen-

ically, furthering the evolutionary process (Bleuler 1925).

Bleuler found evidence for the inheritance of acquired characteristics in the St. Bernard dog's complex behavior. According to Bleuler, the St. Bernard displays special attachment to the rescued individual. If two St. Bernards work together, one stays with the victim and provides warmth and the other runs toward human habitation to summon help. Helping humans is not a natural instinct of St. Bernards; this highly complex behavior serves the survival of humans rather than that of the dogs. Rescue behavior cannot be the consequence of selection. It is also unlikely, Bleuler said, that the St. Bernard's action is the consequence of mutation or spontaneous variation; the probability that such complex behavior emerged by chance is minimal. The training of St. Bernards began, asserts Bleuler, only 250 years ago. About 100 years ago the training ceased because this acquired activity was inherited by its offspring. Additional training that a dog gets now only perfects its innate tendency to rescue people. However, there are cases where St. Bernards, without any training or observation, rescued people. Chance might bring about an arrangement of letters to form a poem, but it is difficult to envision a chance emergence of a group of atoms so arranged as to produce a rescue instinct. The emergence of an instinct requires guidance, and this can be provided by the mneme that fixates experiences that subsequently become inherited (Bleuler 1934).

In the 1930s, Bleuler advocated the reality of parapsychological, or occult, phenomena. Bleuler (1930) described parapsychological phenomena as events that cannot yet be explained naturalistically because our knowledge is inadequate. Parapsychological phenomena, he said, are characterized by a specific kind of relationship between the environment and the psyche; the environment impinges upon the psyche but not through the medium's senses, and the psyche influences the environment but not through the medium's muscles. Attempts were made by critics to declare such phenomena fraudulent, and Bleuler said some are, but not all. He said those that are genuine demand explanation.

"He felt that ordinary laws of physics were suspended during the séance: objects moved through space in the pattern of a horizontal curve; material objects penetrated closed doors and windows."

Bleuler used two strategies in support of his thesis: first, he provided stories that could not be explained naturalistically; and, second, he relied on séances.

As an example of the first approach, Bleuler (1930) told a story of a man who was robbed and murdered. His friend had a vision of this event and told it to the victim's wife. She had the friend arrested, and he spent six weeks in jail, but was released after the real murderer was convicted of the crime.

Bleuler participated in telekinetic séances held by the well-known mediums Rudi and Willy Schneider. Bleuler saw Rudi Schneider move a curtain, start and stop a record player, and replace one record with another, by what he thought to be parapsychological means. Some accusations were made that the curtain was manipulated by the medium's legs.

Bleuler replied that Rudi could not have used his legs because they were resting on Bleuler's knees.

The manifestations of occult phenomena Bleuler felt, testify to their authenticity. Ectoplasm produced by the mediums had been observed. He felt that ordinary laws of physics were suspended during the séance; objects moved through space in the pattern of a horizontal curve; material objects penetrated closed doors and windows. Bleuler (1930:663) writes that "heavy objects fall slowly . . . light objects show the opposite action." He regretted that he had never had the opportunity to see such phenomena, but maintained that these were observed by thousands of people, many of them as critical and clever as we are.

Bleuler was saddened that many outstanding scientists refused to acknowledge the veracity of parapsychological phenomena. For instance, in a séance with Willy Schneider, Rudi's brother, the curtain and a handkerchief moved. One scientist said that the movement of the curtain was caused by the medium's manipulation of the carpet. Yet Willy's legs were said to have been held firmly by a controller, who insisted that he had not noticed them move. Besides, there were eight chairs standing on the carpet, yet none was seen moving. When the carpet was later nailed to the floor, the curtain did not move during the séance, making this scientist say that his hypothesis was confirmed. But, wrote Bleuler, this is not so; the noise made by the nailing of the carpet may have destroyed the medium's power, or the medium, facing distrust, may have been in a bad mood and thus failed to produce the parapsychological phenomena.

Bleuler maintained that even if some parapsychological feats involve fraud, that does not permit the conclusion that all feats by mediums are achieved through trickery. He rationalized that mediums are requested to demonstrate parapsychological powers at times when they are unable to do so because parapsychological phenomena are the products of the unconscious and do not respond to the medium's will. Unwilling to disappoint the audience, they, in an emergency, may resort to trickery, which, considering the conditions, Bleuler felt was understandable.

He felt that the occult deserved to be studied, but with methods that differed from those used in physics and chemistry. Chemistry, maintained Bleuler, can be studied in the laboratory whenever the scientist wants, but parapsychological phenomena as manifestations of the unconscious cannot be produced by the medium on demand. The reaction of the physical and chemical substances is always the same, but the sensitive human mind may react differently to identical stimulus. It is unlikely that Goethe would have been able to write *Faust* in the laboratory if he were ordered to do so and were treated with hostility and suspicion, as were many mediums. He said one should institute rigorous controls only after treating the mediums warmly and expressing confidence in their abilities. They are very sensitive, he said, and when people come to the séance and do not even greet them, the manifestation of parapsychological phenomena cannot be expected.

A complete explanation of beliefs in pseudoscientific phenomena awaits future systematic psychological studies. The case of Bleuler, however, is interesting in that it shows the expression of irrationality in an individual who had been active for decades in the pursuit of what Thomas Kuhn (1970) calls "normal science." The motives behind Bleuler's embrace

of pseudoscientific claims may now, at best, be hypothesized.

Bleuler's preoccupation with parapsychological phenomena occurred when he was in advanced age and confronting the inevitability of death. It may be that by accepting the occult he found evidence for the existence of another world and of immortality. However, Bleuler denies this hypothesis:

> The spiritualists see . . . evidence that there is life after death and reward or punishment for our deeds during our life span. I have up to now not found any evidence in support of this hypothesis. (Bleuler 1930:678)

Another hypothesis is that Bleuler's training as a physician did not provide him with an understanding of the scientific method. However, Bleuler performed sensory experiments at the Physiological Laboratory at the University of Zürich in the 1870s (Gaupp 1940). This means that Bleuler must have known the rudiments of the scientific method. Moreover, in his 1919 book, Bleuler warned his colleagues to beware of reaching conclusions based upon wishful thinking rather than facts. Therefore, this hypothesis has to be rejected.

The third hypothesis is that Bleuler's belief in pseudoscientific concepts was derived from his mnemistic biopsychology theory. It is true that the concept of the inheritance of acquired characteristics has a place within the theory, but its absence would not break the theory. As the theory had to include the concept of instincts, the neo-Darwinian explanation would do as well. However, the acceptance of parapsychology had nothing to do with mnemistic biopsychology theory, as Bleuler (1930: 678-679) himself admitted. Consequently, this hypothesis is rejected too.

"The case of Bleuler is interesting in that it shows the expression of irrationality in an individual who had been active for decades in the pursuit of what Thomas Kuhn calls 'normal science.' "

With the rejection of these hypotheses, a more psychological one may explain Bleuler's propagation of pseudoscientific ideas. Manfred Bleuler (1973), Eugen's son, stated that in the eighteenth century Swiss society was dominated by an aristocratic elite that did not allow the rural, peasant class members to enter universities. But in 1830, Switzerland adopted a democratic constitution, and the members of the lower classes rushed to universities. Among them was Eugen Bleuler, a peasant's ambitious son, who after finishing his studies at the University of Zürich in 1881 achieved the exalted position of professor at this prestigious university and was recognized as one of the world's leading psychiatrists (Gaupp 1940).

Bleuler's retirement ended his work on schizophrenias, as he was cut off from contact with schizophrenic patients. Yet he still craved to make a contribution to science. For years he developed his empirical theory of psychology, but found the doors barred by the rise of experimental psychology. Bleuler was in a quandary. He had none of the specialized skills to venture into, say, chemistry or physics, but may have thought that he could contribute to the study of the inheritance of acquired characteristics and of parapsychology.

Biologists were then greatly interested in resolving the problem of the inheritance of acquired characteristics (cf. Goldschmidt 1931; Haldane 1932). The reality of parapsychology was to be, supposedly, resolved in laboratory experiments (cf. Rhine 1934). Bleuler could hold his own in those controversies. Thus, Bleuler (1934:706) dismissed the fact that there was no experimental support for the inheritance of acquired characteristics by stating that "negative results do not prove anything." In a monumental study, Gulat-Wellenburg, Klinckowstroem, and Rosenbusch (1925) concluded, after studying such famous mediums as Eusapia Paladino and Willy Schneider, that there was no scientific evidence for so-called physical mediumship. Bleuler responded that as soon as proper methods were used, the reality of parapsychological phenomena would be confirmed.

Were Bleuler not the famous psychiatrist that he was, it is doubtful whether his pseudoscientific views would have been published in professional periodicals. Ironically, the tragedy of Bleuler's last years was his inability to follow the advice he gave to scientists—beware of autistic thinking that abandons realistic thought in favor of affective belief.

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Examining the Satanic Panic . . .

. . . *A Personal Perspective on 'Satanism'*

PETER HUSTON

Growing up in the suburbs of upstate New York, I never questioned that Satanists, or "devil worshippers," as we used to call them, existed out there—somehow, somewhere, someplace. Yet, like my relationships with Zulus, Eskimos, and cowboys, I never found reason to give them much thought, at least until I reached my teens. Then in 1980, through a strange, almost accidental series of circumstances, a high-school-age friend of mine purchased a paperback copy of Anton LaVey's *Satanic Bible*. We both had hours of fun showing it off and scaring people. Not that LaVey's teachings are particularly dangerous. The first of these was that you should worship Satan. We didn't. The second was that you should do whatever you felt like doing so long as you didn't harm anyone else. This we had been taught at our rather liberal Methodist church and were actively doing already. Unfortunately, the title, if not the book itself, was just a bit too scary for some people, and in 1982 my friend's date, a born-again Christian fundamentalist, tore the book to shreds (not that she'd ever read it). Other things soon took precedence, and we forgot about Satanism and returned to other activities that we could not imagine had any possible connection to devil-worship, for example, playing Dungeons & Dragons and listening to punk-rock music. Over the next few years, Satanism had little importance in my life.

Then, in 1986, an interesting thing happened.

(continued on page 285)

"What we didn't suspect is that what we saw in Duanesburg was only one manifestation of a national pattern of similar groundless eruptions of terror."

Returning to a theme that occupied portions of several issues of SI *in 1990 and 1991, we here present two authors' assessments about the satanic-cult conspiracy legend in the form of essay reviews of Jeffrey Victor's new book,* Satanic Panic.—EDITOR

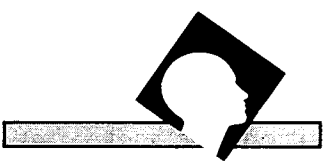
. . . A Sociological and Historical Perspective

TERENCE M. HINES

Satanic Panic is an excellent book that should be read by anyone with an interest in the current epidemic of claims of satanic crimes. Victor provides both a historical and a sociological analysis of this epidemic, along with insights obtained from on-the-scene investigations of a satanic panic in northwestern New York. He describes the history of the development of satanic-conspiracy beliefs in the United States and provides a useful, up-to-date chronology of the major events in the saga.

Victor is a professor of sociology at a State University of New York campus in Jamestown and was able to investigate a satanic rumor-panic directly when one broke out there in October 1987 and lasted until May 1988. Victor interviewed numerous local people about their fears and beliefs. He describes the events that started the panic and kept it going and the responses of local teenagers, adults, and officials. This is a most valuable section of the book, as it provides insights into the minds of those caught up, in one way or another, in the panic. [See Victor's "The Spread of Satanic-Cult Rumors," *SI*, Spring 1990.]

One chapter is devoted to a discussion of the incidence of panics around the country. This is accompanied by an appendix that lists and briefly describes all such panics known to the author. Victor compares these panics to rumors of antisocial activity on the part of other disliked members of society at other times and in other places. Victor notes a wave of anti-Semitic rumors in France in 1968 to the effect that teenage girls were being kidnapped in Jewish-run clothing stores and then forced into prostitution. Victor notes that "many people who claimed to know about girls who disappeared in local stores . . . came forth



"One might hope that mental-health professionals would not fall into the trap of mistaking their patients' delusions, no matter how strongly believed in by the patients, for reports of actual events. But . . . one would be disappointed in such a hope."

Satanic Panic: Creation of a Contemporary Legend. By Jeffrey S. Victor. Open Court, Chicago, Ill., 1993. 408 pp. Hardcover, $38.95, paper, $16.95.

to the police. Yet, the police could find no evidence of any girl being kidnapped" (p. 74). Likewise, while in the grip of a satanic panic, people confidently report events that never happened.

Victor highlights the roles of self-proclaimed "Satan experts," self-proclaimed survivors of satanic cults, and naive psychotherapists in spreading much of the nonsense about satanic activity. The frequently well-paid "experts" are often clergy of one sort or another or police officers who are convinced, in spite of the total lack of physical evidence, that Satanists are roaming the nation killing hundreds, or even thousands, of children and adults each year. These experts attribute the lack of physical evidence, even when extraordinarily messy murders are said to have taken place, to the amazing ability of Satanists to clean up after themselves. Of course this explanation is nonfalsifiable. These experts also help fuel rumor-panics by issuing unfounded statements. These are then "reported in local news articles, often as 'objective' news, without any critical evaluation of the claims" (pp. 67-68). Victor likens these "experts" to propagandists.

"Survivors," who claim to have been directly involved in actual satanic activity in one way or another, also fuel the belief in satanic activity. They have become quite popular on TV talk-shows. Some of their claims are, to say the least, bizarre. These include claims that they became pregnant to provide babies for ritual satanic murder and claims that they committed numerous ritual murders directly. Such claims are never accompanied by any information that would lead to the identification of the victims or the location of the bodies or other members of the cult who could presumably verify the claims. In some respects, these sorts of claims are a good deal *more* dramatic than the now old-hat "I was abducted by a UFO and they stuck a probe up my nose" from the UFO abductees, in that the satanic-cult survivors are actually admitting to participation in horrible crimes. Some survivors seem to be suffering from serious psychiatric disease.

Nonetheless, when they tell their stories on a talk show or in a therapy session, their emotional turmoil, even terror, is very real. Of course that does not mean that the stories they tell are true. But, as is often the case with UFO reports, it is the strong belief and obvious sincerity of the witness (or survivor) that convinces others that their stories are factual, no matter how absurd and no matter how unsupported by objective evidence.

One might hope that mental-health professionals (psychiatrists, clinical psychologists, social workers, counselors, etc.) would not fall into the trap of mistaking their patients' delusions, no matter how strongly believed in by the patients, for reports of actual events. But, at least where stories about satanic crimes are concerned, one would be disappointed in such a hope. Victor points out that a great deal of satanic-cult propaganda comes precisely from a portion of the psychotherapeutic community that is unable to distinguish their patients' delusions from reality. This is also a problem with reports of UFO abductees, but not to so great an extent. The degree to which some therapists have come to believe their patients' paranoid ideation can be seen in a

"Victor . . . traces the history of belief in Satanism from the medieval period. It is clear that tales of terrible doings by Satanists and their allies have been around for a long, long time."

statement by Bennett Braun, Director of Rush Presbyterian-St. Lukes Medical Center's Dissociative Disorders Program in Chicago, quoted by Victor: "We are working with a national-international type organization that's got a structure somewhat similar to the Communist cell structure . . ." (p. 96).

Why do psychotherapists believe survivor stories? Victor attributes the belief to a process of "group-think" and related social pressure within segments of the psychotherapeutic community. Such social pressure occurs at psychiatric seminars on satanic-cult activity. Most of these are organized by the International Society for the Study of Multiple Personality and Dissociation (ISSMPD), which Victor identifies as "the main agency disseminating the satanic cult legend to the psychiatric profession" (p. 95). Their seminars are structured in a way that "does not allow the audience to critically cross-examine speakers or to engage in dialogue with them" (p. 96). Papers given at their meetings are not subject to peer review or published, but often cited nonetheless as "scientific" evidence for the reality of satanic cults.

While group-think, especially in the context of ISSMPD activities, may provide an explanation for some belief on the part of psychotherapists for the reality of their patients' delusions, I think that Victor ignores another important factor. Individuals who plan a career as psychotherapists, especially if they opt for a non-M.D. degree and become clinical psychologists, social workers, counselors, and the like, usually receive minimal training in psychology (topics like memory, perception, the physiological basis of normal and abnormal behavior) and critical and scientific thinking. This is often especially true of students who end up with Master's or "Psy.D." degrees. Further, students who want to become therapists feel that such scientific knowledge is not relevant to their planned career. I don't know how many times I've suggested that a student take a course in, say, statistics, or experimental method, or physiological psychology, only to hear the reply, "Oh, I'm going to become a therapist, so I don't need all that science stuff." Thus, in the same way that schools of education select the least able students to teach our children, and provide them with the poorest training, so schools turning out psychotherapists of various varieties often attract students with little interest in critical thinking and provide little training in it. Further, two recent studies in the *Journal of Social Work Education* (Russel et al., 29: 121-129, 1993; Black et al., 29: 171-180, 1993) have found high rates of traumatic childhood and family experiences among social-work students. I suspect that the same would be found in students in clinical psychology and counseling programs. Thus the individuals who go into therapy may be the least able to exercise critical judgment about what their patients are telling them, because of both their lack of training and their own history of trauma.

Having discussed the origins of the false information on satanic activity,

Victor spends three chapters on specific claims about satanic influence. These chapters cover satanic threats to children, Satanism and teenage crime, and Satanism in schools, books, music, and games. All three chapters provide excellent reviews of their respective topics.

The next five chapters consider the sociology of the anti-Satan crusade, for a crusade is really what has developed. Victor points to the widespread belief in a moral crisis in America as a root cause of the belief in satanic activity. He then describes the dynamics of moral crusades over the centuries, including separate chapters on the search for scapegoats, the rhetoric of the anti-Satan crusade, the organization of the crusade, and the politics of the crusade. These chapters are well done and very informative. However, at the end of Chapter 10 ("The Search for Scapegoat Deviants"), Victor has a most unfortunate attack of psychobabble. He contends (p. 205) that the responses to claims of satanic activity have been so strong because Satan is a "kind of projective mirror of the self. It enables people, individually and collectively, to project outward all their own self-perceived 'sins' and shortcomings. By hating Satan, they are able to convince themselves that they need not feel guilt or responsibility for those things they most passionately condemn." Further, "the scapegoat deviance of Satanism can be viewed as a projection of serious unconscious inner conflicts in the feelings of a great many parents about how they relate to their children." Fear of Satanism "may also reflect parental feelings of ambivalence and even hostility toward children, born out of conflicted feelings that the children they love are a stressful burden in their already stressful lives."

This type of "explanation" seems to me to be utterly useless. It is almost as nonfalsifiable as the foul deeds of the supertidy Satanists. A more parsimonious explanation would point to the great amount of media hype about this topic, along with the seeming plausibility of the claims, compared to the implausibility of the claims of UFO abductees. Further, the satanic crusade is far more organized than the UFO abductees and has far more credible-sounding spokesmen, including some clergy and police officials. No need, it seems to me, to hypothesize vague internal, unconscious processes to account for the reactions to rumors of satanic activity.

Finally, another strength of Victor's book is its substantial historical content. Victor places today's crusade in the context of similar happenings throughout history. One of the most fascinating chapters traces the history of belief in Satanism from the medieval period. It is clear that tales of terrible doings by Satanists and their allies (often identified as Jews) have been around for a long, long time. Nor are "survivor" stories new. During the wave of anti-Catholic feeling in the United States in the 1830s and 1840s, claims were made that women were forced into convents where all sorts of awful things (sex, murder, etc.) occurred. Sure enough, individuals appeared who wrote books claiming to have survived such horrible experiences. One, by Maria Monk, became a bestseller of the time.

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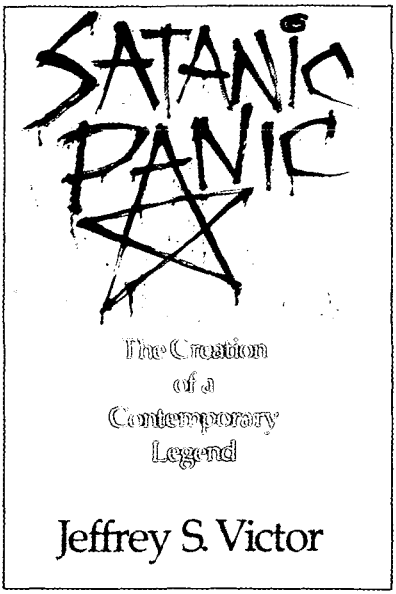
(continued from p. 280)

Sparked off by graffiti in the form of "AC/DC rules!!" "Ozzy Osbourne," and a couple of pentagrams, many residents of the nearby rural town of Duanesburg became terrified by rumors of hidden satanic cults that mutilated cattle and perhaps conspired to sacrifice children. Of course, being young, we knew that Ozzy Osbourne was a particularly idiotic and childish rock star who used satanic motifs as an attention-getting device. To us it seemed obvious that some particularly idiotic Ozzy fan, who had felt compelled to spray-paint Ozzy's name on a building, would add a pentagram or two for good measure. Still, the town was terrified and people panicked.

Sensing the pure ridiculousness of the idea of a long-hidden cult, we responded in a natural fashion. We watched the developments on TV and laughed a lot. We did contemplate intervening though. For example, we toyed with the idea of dressing like Satanists and also plotted a hoax recruiting drive in the town. We soon sensed that this plan might involve dodging 12-gauge shotgun blasts fired by misguided farmers and deer hunters intent on protecting their three-year-olds from an imaginary threat of satanic child-sacrificers. Therefore we did nothing, and ultimately the town calmed down without further event. Then, in 1990, the rumors broke out again in nearby Cobleskill. (I was out of the area that time.) Obviously, there was something quite peculiar at work here. What we didn't suspect was that what we saw in Duanesburg was only one manifestation of a national pattern of similar groundless eruptions of terror. If we had, perhaps we would not have laughed so hard about it all.

In *The Satanic Panic*, sociologist Jeffrey S. Victor fully describes the



mechanisms and effects of these occurrences. Since many readers are familiar with Robert D. Hicks's excellent book, *In Pursuit of Satan: The Police and the Occult*, it seems beneficial to compare the two works. (See *SI*, Spring and Fall 1990, for Hicks's two-part article "Police Pursuit of Satanic Crime." Can we learn anything from a second book on this fascinating subject? The answer, somewhat surprisingly, is a definite "yes."

As Hicks's work details in page after page, there is little or no evidence of a mounting satanic conspiracy to undermine and disrupt the American way of life. The occasional rumors, hysteria, and panics that break out because of these fears are groundless. When such claims are looked at carefully and systematically they either fall apart completely or have a much more mundane cause than had been suspected. As a sociologist, Victor quickly surveys the facts of the matter but then soon moves beyond that to focus on the reasons such panics find fertile ground. He explains the sociological processes of rumors

and describes the way they spread, the effects they have on society, and the systems that propel them. Hicks's work focuses on the "what" of the matter; Victor's, on the "how" and "why." The two books complement each other.

According to Victor, tension in our society is mounting. This is particularly true in rural areas, and especially so in the so-called rust belt (where the events described above took place). As factories close and jobs move out, incomes go down; as the divorce rate climbs, and malevolent outside influences like drugs come into the area, people become more and more insecure and worried about the future. And, as Victor points out, justifiably so. What happens next is that these fears become personified—particularly under the stimulus of local fundamentalists—and the fear of a satanic cult in the area grows. Although not created by them, such rumors are spread quickly by network talk-shows and other mass and local media. Tension continues to rise. Eventually something outside of the experience of the local population comes along, sparks off excitement, and then after being severely distorted by local teenage and adult rumors, becomes labeled as possibly satanic. As the population reacts in an appropriate manner to what they perceive to be a very real threat, further and even wilder rumors find fertile ground. People respond by keeping their children home from school for fear of satanic kidnappers, looking for Satanists everywhere, or calling for increased police action. It's a frightening process.

Victor describes the "moral crusade" that responds to the perceived satanic threat. It is made up of several disparate and widely divergent groups. Among these are fundamentalist clergy and televangelists, who find the idea of hidden satanic cults quite consistent with their theologically based view of the world; and persons working in mental health, child protection, and law enforcement who have come to sincerely believe in the existence of these cults and unconsciously prompt children to tell stories consistent with their own preconceived beliefs.

Victor's work expands considerably on the content of *In Pursuit of Satan*. For example, one weakness of Hicks's work is that he ignores many of the "Satanists" who we know exist. The disturbing fact is that many people, such as the above-mentioned anonymous spray-painting Ozzy fan, do find satanic motifs exciting. Seeing "disillusioned youths," teenagers, and others who have a growing interest in Satanism and a constant flirtation with literature, pop music, and much else with satanic themes, one begins to wonder exactly how these youths fit into the overall picture. If nothing else, a group of antisocial delinquents decorated with pentagrams and "666" emblems makes it difficult to convince laypeople that Satanism is nothing to worry about. Victor addresses this troublesome phenomenon. These people do have an interest in Satanism and can be vicious and dangerous. However, they are not really approaching Satanism in the way most people normally approach a religion. If questioned, such individuals generally have only a very crude interest in, and knowledge of, any theology. They are using satanic elements gathered from easily accessible works (such as the above-mentioned *Satanic Bible*), as well as pop-culture representations of Satanism in motion pictures and rock music. They tend to pick and choose from among these in order to form what Victor describes as a "deviant ideology." They are using crude notions of Satanism to form a

justification for their antisocial acts. The end result is not really Satanism in the sense of a religion. Furthermore, there is absolutely no evidence that any effort is being made by adult Satanists to recruit these people into an organized movement or religious group. Their ideology, their organization, and their actions tend to exist at only a local level, and are not indicative of a national conspiracy of any sort.

Victor's work is sweeping in its scope. He cites incident after incident to prove his point. In fact, if his book has a fault it is that at times he gives examples of incidents without providing enough substantive detail to back up his points. For example, in 1988 in Montezuma Creek, Utah, a high-school counselor was dismissed from his position because of allegations that he was promoting Satanism. Victor uses this as an example, but does not explain what it was that the counselor was in fact promoting. This is a trend that crops up in a few places in this nevertheless excellent book. Of course the incident is footnoted so that readers can investigate further, but it remains frustrating.

Victor includes an extensive bibliography and a useful list of experts and organizations that deal with satanic-cult rumors from a skeptical point of view. *Satanic Panic* is a rational study of beliefs and panics about satanic-cult conspiracies in America. I highly recommend it. Although Victor makes it clear that such panics are likely to continue until the underlying causes of social stress are reduced, a clear understanding of the situation should at the very least reduce the potential for damage when such outbreaks do occur.

Peter Huston has long since stopped trying to scare people, and now attempts to calm them down by occasionally contributing to the SKEPTICAL INQUIRER. *He is knowledgeable on Asian cultures and hopes to pursue graduate study in that field. His interests include psychology, history, religion, pre-hospital care, and, of course, skepticism.*

The Tradition of the Scientific Method

It is usual that wrong results produce a few people who continue to believe in them. Blondlot, for example, published a book on N-rays two years after they were shown not to exist by Wood. And although the consensus of the scientific community has now turned against cold fusion, a few hundred researchers continue to list positive results, whether consistent or not, and to ignore or criticize the more numerous null experiments often performed with superior apparatus. In contrast, there are some who listen to criticism and who are self-critical, who take the possibility of error seriously and perform experiments designed to look for falsification. It is to the credit of Andrew Hime, Nick Jelley and Eric Norman that they have resisted the human desire not to prove oneself wrong, have checked and repeated their experiments [which they originally interpreted as supporting the discovery of a neutrino with a mass of 17 keV] and have announced errors that are identified. One respects them for following the tradition of the scientific method.

—Douglas R. O. Morrison, "The Rise and Fall of the 17-keV Neutrino," *Nature*, 366:29-32, November 4, 1993.

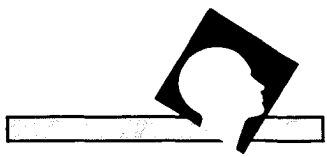
Philosophy and the Paranormal

Part 2: Skepticism, Miracles, and Knowledge

WILLIAM GREY

In Part 1 of this article I examined the nature of paranormal belief and suggested that such beliefs are a pathological expression of the same capacities that have provided profound insights. I noted in conclusion that paranormal claims often conflict with laws of nature. The violation of a law of nature is one definition of a miracle, and it is to this topic that I now turn. David Hume's essay "Of Miracles" (1748), written more than two centuries ago, still provides timely advice for evaluating "psi" and comparable anomalous claims. Indeed, Hume's epistemological principles are helpful for evaluating any situation in which we are confronted with conflicting testimony.

Hume's essay was written in response to what he regarded as an upsurge in credulity, though one that occurred within the then prevailing context of Christian belief, which was in many ways different from our contemporary New Age enthusiasms. But the eighteenth century had its own Shirley MacLaines, making claims conspicuously at odds with deliverances of ordinary experience, and Hume wanted to assess the credentials of these claims. As well as being a topic of interest to Hume's contemporaries, miracles played a role in natural theology—the attempt to prove the existence of God, and sometimes human immortality, on



Hume felt that the problem of witness credibility, human credulity, conflicts of testimony, and the tribal origins of superstition undermine the credibility of any claim in support of the miraculous.

This is the second and concluding part of an article examining some fundamental issues raised by paranormal claims.

the basis of observation and experience—and this was a subject that also interested Hume deeply. The classical refutations of the central arguments of natural theology were systematically developed by Hume in his posthumously published *Dialogues Concerning Natural Religion* (1779).

What is a miracle? In the vernacular we use the term *miraculous* to characterize an event that is extremely unlikely—at odds with the normal course of experience—such as a "miraculous escape." A miracle in this (weak) sense is a very improbable event. Hume had a stronger sense of "miracle" in mind, namely, something that violates a law of nature. It is in this sense that miracles have commonly featured in religious systems of belief, as the means by which God has been thought to have demonstrated his power to his chosen people. The question that Hume addresses is: Are we justified in believing that miracles have in fact occurred? He argued for the very strong conclusion that we are never justified in believing that a miracle ever occurred.

There is a common misunderstanding that must be corrected at the outset. Hume was *not* claiming to show that miracles have never occurred. Proving negative existence claims is notoriously problematic. Hume's claim was the importantly different one that we are never rationally justified in believing that miracles have occurred. That is, Hume addresses the epistemological issue of what it is rational to believe, rather than the metaphysical question of what is and is not possible in our sort of world.

The argument has two parts. First, Hume argues that the evidence *against* miracles is usually very strong. (And according to one of Hume's epistemological maxims, "A wise man proportions his belief to the evidence.")

"Hume maintained that there never was a miraculous event established on sufficiently strong grounds to warrant rational belief in its occurrence."

We have therefore to weigh the evidence that a miraculous event happened against the evidence that it did *not* in fact happen. In evaluating a claim that a miracle has occurred, Hume (1748: 115-116) advanced the following principle which—echoing Ockham—has been called Hume's Razor:

> No testimony is sufficient to establish a miracle unless that testimony be of such a kind that its falsehood would be more miraculous than the fact which it endeavours to establish.

The second stage of the argument claims that even though the evidence in favor of miracles *might* outweigh the evidence against them, *in practice this never happens.* Hume maintained that there never was a miraculous event established on sufficiently strong grounds to warrant rational belief in its occurrence. There are four factors that undermine the credibility of any claim in support of the miraculous.

First there is the problem of witness credibility. Witnesses who testify to the occurrence of miracles are seldom totally above suspicion either of having been deceived or of having the intent to deceive. In evaluating their testimony we must always choose between believing (*a*) that a miracle occurred, and (*b*) that the witnesses were deceived or deceitful.

According to Hume (1748: 116), no miracle has ever been "attested by a sufficient number of men, of such unquestioned good sense, education and learning as to secure us against all delusion in themselves; of such undoubted integrity as to place them beyond all suspicion of any design to deceive others. . . ." All claims for miracles, that is, suffer from what we call a credibility gap.

The second problem that Hume identifies is human credulity. There is a natural human affinity for the novel, the surprising, and the marvelous. Recognizing this propensity for credulity, we must take note of and be guided by the following maxims in evaluating claims for the miraculous:

> Objects of which we have no experience resemble those of which we do have experience.
>
> What we have found to be most usual is most probable.
>
> In case of dispute, give preference to the side favoured by the greatest number of observations.

These sound, if somewhat pedestrian, maxims are frequently overridden by the excitement and novelty that is often the basis of human credulity.

The third point about miraculous claims to which Hume (1748: 119f.) draws our attention is the tribal origins of superstition. Miracles occur mainly in primitive (in Hume's words, "ignorant and barbarous") nations, or are derived from "ignorant and barbarous" ancestors.

Finally, Hume (1748: 121f.) points to the problem of conflicts of testimony that confronts claims of the miraculous. It is impossible that the religious traditions of "ancient Rome, of Turkey, of Siam, and of China" can all be established on a solid foundation. Every miracle claimed within any one of these traditions is intended to establish the truth of that tradition. But it also is intended to discredit the claims of other, competing traditions, and in particular to undermine the miraculous claims of its competitors. In the absence of independent support, claims about miracles cannot endorse any one of these traditions over any of the others.

Hume believed that the propensity of humankind to superstition and the marvelous may receive some check from sense and learning, but he also seems to have believed that it could never be thoroughly extirpated from human nature. Hume, I suspect, would not be surprised to find beliefs in astrology, UFOs, crystals, channeling, and similar credulous ideas widespread in the twentieth century.

I repeat that Hume was not claiming that he knew that miracles never occur. His claim was rather that it would never be rational to suppose that they do. He was advancing an empirical argument (that is, an argument based on factual claims) against the credibility of miracles. Hume was a skeptical philosopher par excellence, and I turn next to the virtues of skepticism.

The Virtues of Skepticism

Skepticism can be characterized as a critical stance with regard to knowledge (or existence) claims, and a skeptic is one who calls such claims into question. Skepticism can refer to either (a) the critical stance adopted in subjecting knowledge claims to careful scrutiny or (b) a state of doubt or disbelief that may be the outcome of such an inquiry. Being skeptical in the second sense (withholding assent, or suspending belief in a particular claim) need *not* involve believing the opposite. Skepticism is a matter of *doubt* rather than denial. If I withhold

assent from the claim that God exists, it need not be the case that I believe that God does *not* exist. I might believe that the evidence is just not strong enough to settle the matter either way.

We need to distinguish between *critical* and *dogmatic* skepticism, and between *selective* and *global* skepticism, though these terms do not mark absolute distinctions. That is to say, skepticism can be more or less dogmatic and more or less global. Skepticism is *dogmatic* if assent is withheld a priori, that is, on the basis of prior conviction without considering the evidence. For example, Galileo's colleagues expressed a perfectly intelligible skepticism about the existence of the moons of Jupiter; they became *dogmatic* when they refused to look through his telescope. Skepticism is global if it is general and encompasses *all* claims to knowledge; selective if it is targeted to *specific* knowledge claims. Global skepticism is rare. Perhaps the Greek philosopher Cratylus, an older contemporary of Plato (c. 428-c.348 B.C.), is the most global skeptic recorded in the annals of philosophy. His skepticism is said to have been so extreme that he refused to answer questions and would only wave a weary finger at his interlocutor to indicate that truth was so elusive and ephemeral that it would be useless to reply.

Skepticism that falls short of the global, as it usually does, always has to be qualified by specifying the subject matter to which it is directed. There are various beliefs, for example, beliefs about rocks and tables, that are relatively immune to skeptical doubts—at least outside philosophy seminars. At the other extreme, there are tooth fairies and Santa Claus, which most will immediately dismiss as lacking sufficient epistemic warrant. In between (drawing boundaries here inevitably creates controversy) there are various disputed cases and claims, such as God, supply-side economics, nuclear deterrence, and paranormal phenomena. Disputed cases are also the coal-face for the professional philosopher: On which side of the dividing line, for example, should we put minds, beliefs, desires, meanings, properties, and numbers?

"The purpose of skepticism is (usually) not to raise extravagant doubts (although that is sometimes an unintended consequence), but rather to clarify our understanding of the subject of inquiry."

When confronted with a claim about some strange, paranormal, or similarly anomalous phenomenon (an accurate premonition, a "near death" or an "out of body" experience, say), we should adopt a scrupulously skeptical approach. By this I do not mean that we should conclude that the experience did not occur or that whoever had the experience must have been somehow deluded. Rather, we should be alert to the possibility of natural and ordinary explanations of unnatural and extraordinary occurrences. We must be especially careful in evaluating the evidence that appears to support such anomalous events. While rejecting a dogmatic skepticism that refuses to countenance anomalous events, critical skepticism seeks to gather as much evidence as possible concerning any extraordinary or allegedly paranormal event, claim, or theory.

Critical skepticism means keeping an open mind and not rejecting disputed claims a priori (that is, on the

basis of prior conviction without considering the evidence). We must be scrupulous in examining the evidence. But it means refusing to accept as true claims for which there is insufficient or ambiguous evidence, and recognizing that withholding belief is preferable to accepting claims for which there are not sufficient grounds. And it means adopting as a methodological maxim the principle that in seeking explanations we should prefer the ordinary to the extraordinary and the simple to the complex. This is one interpretation of a methodological principle commonly attributed to William of Ockham (c.1285-1349) and known as Occam's Razor.

Skepticism is the disposition, or art, of matching belief to evidence. There is at present no convenient antonym for "skeptic." For convenience, I propose to revive the archaic expression "credulist" to serve this role. A credulist can be understood as someone who is apt to accept claims without sufficient evidence, that is to say, someone whose epistemic standards are too low.

Etymologically, *skeptikos* means "inquirer," and the value of skepticism is that it leads to—and when seriously entertained is usually the result of—a systematic inquiry into the foundations of knowledge. Skeptical arguments play a central role in inquiry, particularly philosophical inquiry, where they have been directed not just at eccentric belief systems but also at beliefs that most regard as self-evident. Thus skeptical arguments have been raised about the existence of other minds, knowledge of the past, knowledge of material objects (the "external world"), moral truths, sensory knowledge, and even about knowledge of logic and mathematics. The purpose of skepticism in these cases is (usually) not to raise extravagant doubts (though that is sometimes an unintended consequence), but rather to clarify our understanding of the subject of inquiry. There are apparently more modest forms of skepticism that challenge, for example, theological or metaphysical knowledge. And in some cases—for example, with respect to astrology or phrenology—skepticism seems to be not merely defensible, but appropriate.

When pressed to extremes, skeptical arguments sometimes turn out to be self-defeating, and the critical pursuit of knowledge leads to a denial that knowledge is attainable. Extreme or global skepticism has often been the consequence of setting unreasonably high standards as to what is acceptable as knowledge: in particular, setting absolute certainty (the impossibility of being mistaken) as a requirement for genuine knowledge.

Common objections to skepticism are: first, the claim that skeptics demand unrealistically high standards of proof (often accompanied by the charge that the skeptic's insistence on these standards is unjustified), and second, an insistence (sometimes dogmatic) that a disputed category of experience (a psychic experience, say) is more certain than any skeptical argument that calls it into question.

Regarding the first point, the insistence on protocols, controls, and repeatability are based on the belief that nature is consistent—and human nature suspect. No one demands 100 percent repeatability. There are always anomalous observations due to the quirks of experimenters or their apparatus. (Indeed, with complex scientific experiments it is a formidable task to get anything to work at all.) But for any extraordinary claim to gain respectability, it has to be replicable by someone somewhere.

The problem with psi phenomena is not that it is difficult for careful

"While rejecting a dogmatic skepticism that refuses to countenance anomalous events, critical skepticism seeks to gather as much evidence as possible concerning any extraordinary or allegedly paranormal event, claim, or theory."

researchers to get it to work occasionally under rigorously controlled conditions; it is difficult for careful observers to get anything at all that can't be dismissed as noise, error, wishful thinking, chance, or fraud. It is for this reason that the requirements of controlled experiments and repeatability cannot be dismissed as unduly fussy: experience shows that nature does not cheat and that people do. There are a number of manipulative techniques, such as "cold reading" (see Hyman 1981), that are well known to psychics (and magicians) and are used to fool people into believing that some individuals possess special psychic powers.

In the history of philosophy we find skeptical arguments are repeatedly proposed and then attacked and "refuted." Skepticism is a continuing challenge to dogmatic claims and helps to maintain the spirit of free inquiry. Without skepticism we would be in danger of failing to distinguish enthusiasm, prejudice, and superstition from serious, rational, and well-grounded beliefs, which are essential to the task of making sense of the world. Perhaps the main danger for skeptics is that they sometimes have difficulty in distinguishing hard and soft data; that they set their standards of epistemic acceptability at too high a level (in contrast to credulists, whose epistemic standards are too low) and may tend to promote their own form of dogmatic conservatism. The aim of skepticism, however, should be to combat doctrinal rigidities that can afflict any belief system, but skeptics must remain alert to the possibility of falling prey to rigidities of their own. Skepticism is all about matching belief to evidence. It is a difficult and continuing challenge to maintain the right proportion of skepticism in our inquiries. Only then are we able to steer between the Scylla of dogmatism and the Charybdis of credulism.

Concluding Remarks

Understanding the process of theoretical development helps us to understand the nature and appeal of paranormal and deviant belief systems. As in medicine, where we learn about the economy of the healthy body through examining its pathology, so in the case of belief systems we learn much through examining the pathological cases presented by alternative epistemologies. Our understanding of the health of cognitive systems, like the health of organic systems, is deepened by a study of their pathology. This is why the study of paranormal beliefs has implications for our understanding of systematic inquiry. And—to continue the medical analogy—one of the principal virtues of skepticism is its role in promoting epistemological hygiene.

No blanket rejection of paranormal claims is possible: each claim has to be assessed on its merits. And psychic claims, even if they ultimately turn out to be nonsensical, may be the source of harmless amusement. For some people, belief in psi provides a map of

their experiential territory for which no other is available. Many hope that somewhere in the dross there is some nugget of psychic or paranormal truth. But the prospects are not promising. After more than a century of controlled investigation following the establishment of the Society for Psychical Research in 1882, the search for incontrovertible evidence for psi is at best inconclusive. The psychologist David Marks argues that until parapsychology produces at least one repeatable demonstration it can be justifiably ignored (Marks 1986: 123).

But even if the pursuit of psi has not revealed anything interesting about the world, it has revealed much of interest about human psychology and about how we think about the world. While we have no reason to suppose that there are any hidden forces, synchronicities, or noncausal determining factors, the search for psi phenomena does reveal a lot about human credulity and the love of wonder that Hume lamented.

It shows that we are pattern-making creatures par excellence; we have a great capacity to discover pattern in the world, and when we don't find it we are disposed to invent it. What we find, above all, is a thirst for pattern in the chaotic gestalt of our experience. There is a powerful urge to embellish our lives with pattern—to locate ourselves in networks of meanings. There is pattern that we discover and pattern that we invent. A major and continuing epistemological task is to distinguish between the two.

The search for—and discovery of—pattern is a lietmotif of perhaps the most distinctive human characteristic: the cognitive capacity to develop an understanding of ourselves and our world. Perhaps a final moral to be drawn is that humanity's characteristic love of wonder, which Hume lamented, is—if unconstrained—as likely now as it was when Hume was writing to lead us astray in our search for truth.

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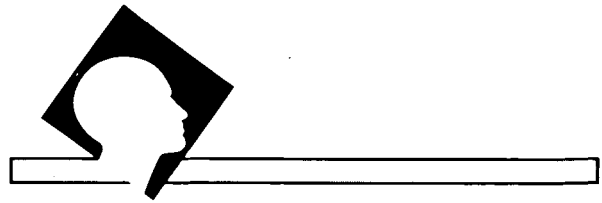
Focus and Attitude

[Richard P.] Feynman's cryptic remark, "no one is that much smarter . . . ," to me, implies something Feynman kept emphasizing: that the key to his achievements was not anything "magical" but the right attitude, the focus on nature's reality, the focus on asking the right questions, the willingness to try (and to discard) unconventional answers, the sensitive ear for phoniness, self-deception, bombast, and conventional but unproven assumptions.

—P. W. Anderson, Joseph Henry Laboratories of Physics, Princeton University (*Science*, 259, January 22, 1993, p. 22).

Book Reviews



Irrational Disbelief

Denying the Holocaust: The Growing Assault on Truth and Memory. By Deborah Lipstadt. Free Press, New York, 1993. 278 pp. Hardcover, $22.95.

TERENCE M. HINES

Skeptics are obviously familiar with irrational belief. But there is a flip side to it that is far rarer. This is irrational disbelief, the continued lack of acceptance of some event or phenomenon in spite of overwhelming evidence of its reality.

Until very recently, the best-known example of irrational disbelief was the claim that the manned moon landings were hoaxes that had been filmed by NASA in a Hollywood movie studio. In the past few years, however, another irrational disbelief has become more common and has attracted public attention. This is the claim that the holocaust never took place and that claims that it was real are part of a massive Jewish plot to discredit Germany and enrich Israel. This contention first achieved wide public exposure in 1991, when Bradley Smith, an active holocaust denier, tried to place a large ad in college newspapers across the country denying the reality of the holocaust. Some papers accepted the ad and some didn't; but, whatever the decision, the ad sparked great controversy and got the claims of the deniers into the public eye more than they ever had been before.

Deborah Lipstadt has investigated the holocaust denial movement, and *Denying the Holocaust* presents the results of her work. It is a chilling book. The deniers tend to be well organized and well funded. Their major goal is to get their claims discussed as a serious and legitimate "other side" of a previously nonexistent debate about whether the holocaust actually took place. One method of doing so, in addition to putting ads in campus newspapers, is to create mock-scholarly organizations, such as the Institute for Historical Review (IHR), and to publish books and journals, such as the IHR's *Journal of Historical Review*, that include all the trappings (footnotes, references, etc.) of real scholarship.

One can reasonably ask how anyone could seriously contend that the holocaust didn't happen. The deniers manage to do this only by frequently misrepresenting and distorting historical sources. They also contend that reports of survivors of concentration and death camps are frauds and that admissions from convicted war criminals, camp guards, and other personnel were coerced and are untrue. The vast number of documents captured after the war from the Nazis are said to have been created at the end of the war by the Allies, in league with the Jews, to

discredit Germany. The gas chambers at Auschwitz are said either not to have existed in the first place or to have really been used for disinfection. In short, the claim is that a massive plot, conspiracy, and cover-up is in operation that makes the claim that the government is hiding the "truth" about UFOs look like a fixed parking ticket.

Can anyone really believe such nonsense? Readers of this journal will not find it difficult to accept that any idea, no matter how far divorced from reality, will find acceptance somewhere. The more interesting question, it seems to me, is whether the organizers of the denial movement really believe their own claims. It is difficult to be sure, of course, but Lipstadt documents so thoroughly their misuse and misrepresentation of historical sources that I find it difficult to believe that this is not done with total knowledge that the holocaust was very real. Such misrepresentations would be impossible to do simply by being sloppy. The real motivating factors seem to be anti-Semitism and a desire to impugn Israel.

People who read the output of organizations like the IHR, and who are ignorant of history, will be misled into doubting the reality of the holocaust. This is not a trivial point. We have read much, in this journal and elsewhere, about the appalling lack of knowledge of science, especially on the part of today's students. These students show an almost equally appalling lack of knowledge of history. Thus they are easy targets for claims made by the denial movement.

Lipstadt's book is explicitly not a debunking one. She specifically argues that to attempt to debunk the claims of the deniers would be to be drawn into their argument and thus to give them some of the very legitimacy they seek as the "other side" of a debate. To this end, she has refused to appear on talk shows to counter the claims of the deniers. Readers will disagree about whether this is a proper strategy. Nonetheless, in the course of outlining the deniers' claims, Lipstadt has provided excellent rejoinders to their arguments.

This is an important book that should be widely read.

Terence Hines is a professor of psychology at Pace University, Pleasantville, New York.

Insightful History of Cold Fusion Drama

Bad Science: The Short Life and Weird Times of Cold Fusion. By Gary Taubes. Random House, New York, 1993. 503 pp. Hardcover, $25.00.

TERENCE M. HINES

This is by far the most detailed history of the cold-fusion episode. In the course of writing this excellent book, Taubes, a well-known science journalist, interviewed more than 260 people at universities and laboratories all over the country who had been involved one way or another in cold-fusion research. The result is an almost day-by-day account of what

happened at all the important centers in the cold fusion story. The writing is so well done that the reader feels like an eyewitness to the unfolding drama. This is an extremely valuable contribution to the literature on this topic.

The detail provided makes it very clear that sloppy experimental design and even sloppier logic were responsible for the belief in cold fusion. The major participants in the story, of course, are Stanley Pons and Martin Fleischmann, the University of Utah chemists who first reported cold fusion to the press in March 1989. The two previous books on cold fusion that I reviewed here earlier (*Too Hot to Handle*, by Frank Close, Winter 1992, and *Cold Fusion: The Scientific Fiasco of the Century*, by John Huizenga, Winter 1993) both painted unfavorable portraits of them. Taubes's book makes it clear that both Pons and Fleischmann, and especially Pons, were more mendacious in reporting their research than has been reported previously. For example, the first claims by Pons and Fleischmann were based on experiments run without the control conditions that even a high-school chemistry student would have realized were needed. But Pons and Fleischmann were not at all forthcoming about this lack.

The lack of proper control experiments, Taubes makes clear, was a major problem with research at many labs that reported findings used to support cold fusion.

This book's revelation that the cold-fusion ruckus was not the first time that Pons and Fleischman had made major errors and false claims is especially useful. Taubes describes several other such incidents that resulted in published papers that "range(d) from dead wrong to recklessly interpreted" (p. 11).

Considerable space is also devoted to the findings that emerged from the laboratory of John Bockris at Texas A&M University. While Pons and Fleischmann claimed only to find excess heat in their fusion cells, the Texas lab also claimed to find tritium, a product of fusion that would have to be found if it were really taking place.

The combined finding of tritium and heat was taken as strong support for the reality of cold fusion. Alas, the tritium appeared only sporadically and, like other cold-fusion findings, could not be reproduced. The actual pattern of the appearance of tritium, only a few fusion cells and only every now and then, led to a suspicion that someone was adding tritium to the water to fake positive results. Taubes analyzes this possibility at some length and makes it fairly clear that a graduate student in the lab was responsible.

The finding of excess heat in Bockris's lab was as ephemeral, if not as suspicious, as the finding of tritium. Bockris's claim that the finding was real is a perfect example of how disregard for the basic rules of scientific evidence kept the cold-fusion debate going. As might be expected, sometimes a fusion cell would run a bit hotter than would be expected and sometimes a bit cooler. This would be the case even if no fusion at all was taking place. The temperature would vary around some mean. However, cells running cooler than expected were negative results. Bockris wasn't interested in negative results, saying that they "can be obtained without skill and experience" (p. 322). Thus, findings of cells running cooler than expected, which would have argued against the reality of cold fusion, "were considered mistakes and stashed in a drawer. When the cells appeared to produce excess heat, this was considered evidence for fusion"

(p. 322).

Taubes shows that, like Pons and Fleischmann, Bockris has a history of making wild claims based on faulty experiments. In 1982, for example, he claimed to have found a "secret catalyst" for a process to reduce water to hydrogen and oxygen. If true, the result would have greatly facilitated the production of hydrogen. But it wasn't true, and the ensuing controversy "ran like a prototype of cold fusion" (p. 278). Bockris is now working on the "electrochemical transmutation of elements" (p. 427).

Overall, this book is much less technical than the two mentioned earlier. It also includes only a small amount of material on previous episodes of pathological science, including the previous cold-fusion claims covered in Huizenga's book. The wealth of detail and insight into the operation of the cold-fusion supporters more than makes up for this lack. The book is also more up to date than the others, having been finished late in 1992. At that time, Pons and Fleischmann had set up shop at a secret laboratory somewhere in France, allegedly supported by funds from a company called Technova, owned by Toyota. It is a great irony that Pons now lives in Nice. One gets the sad image of this man spending the rest of his life vainly trying to convince the world of the reality of cold fusion, just as René Blondlot did with N-rays in the same city so many years go.

Nary A Miracle In Sight

Looking for a Miracle: Weeping Icons, Relics, Stigmata, Visions and Healing Cures. By Joe Nickell. Prometheus Books, Buffalo, N.Y., 1993. 253 pp. Hardcover, $23.95.

ROBERT A. BAKER

In the latter part of the eighteenth century the Scottish philosopher David Hume asked himself the question, Are we ever justified in believing that miracles have in fact occurred? Hume's answer was no. He did not, however, claim to show that miracles *have never occurred,* since proving negative existence claims is notoriously problematic. Hume's claim is the importantly different one that we are never rationally justified in believing that miracles have occurred. In essence, Hume is addressing the epistemological issue of what is rational to believe, rather than the metaphysical question of what is and is not possible in our sort of world. Recognizing that Hume's argument that the evidence *against* miracles is usually very strong, the multitalented Joe Nickell nevertheless believes that we should never "put the cart before the horse by deciding, antecedent to inquiry, whether or not miracles exist." Nickell insists that, like other mysteries, the problem of miracles should be neither fostered nor dismissed, but should be approached in a rigorous and fair manner and *investigated.*

In *Looking for a Miracle,* the most

recent volume of his series of inquiries, Nickell investigates a large number of "miracles." Forgoing biblical claims of the miraculous, Nickell focuses instead on more modern "miracles"—those that, being more recent, can be successfully investigated. While some biblical phenomena have to be referred to occasionally, Nickell's main focus is on the "question of whether or not miraculous events are part of the reality of today's world." To complete this mission Nickell looks first at the assertions surrounding the Shroud of Turin, i.e., claims that the Shroud is tangible proof of Jesus' resurrection. Then he examines the claims surrounding the Image of Guadalupe—a supposedly miraculous self-portrait of the Virgin Mary—as well as other miraculous pictures. In the following chapter Nickell looks at "magical icons," animated statues, statues that weep and move and bleed and, on rare occasions, even move about as if in search of someone or something.

In Chapter 4, Nickell reviews the "mystical relics like the periodically liquefying blood of Saint Januarius." Also studied are the reputedly "incorruptible" bodies of a number of other saintly figures, such as Saint Cecilia, Saint Sperandia, Saint Philip Neri, Saint Alphege of Canterbury, and numerous others whose bodies were claimed never to have deteriorated. A particularly intriguing phenomenon that has, thus far, received little attention is that of "burning handprints"—prints found scorched into the pages of books or onto consecrated cloth—which are alleged to be from the unrequited spirits of the dead. Nickell's reproduction of these mysterious handprints and his exposure of how they are accomplished are both clever and entertaining. Chapter 5 is particularly stimulating because it concerns claims of the so-called Pentecostal Powers, i.e., such things as healing via the "laying on of hands"; glossolalia, or "speaking in tongues"; prophecy, or the "gift of the spirit"; snake handling and strychnine drinking; and the eating of burning materials.

The next chapter explores claims of faith healing, including those made for the so-called "miracle" cures at Lourdes. Most enlightening is a section on exactly how a faith healing "cures" the subject. Nickell's account of how many TV evangelists and other con artists carry out their swindles is amusing. Another section dealing with Mary Baker Eddy and the Christian Scientists, as well as Edgar Cayce and his naturopathic treatments, is insightful—even for those familiar with these "healers" and their work. Chapter 7, which is concerned with "Ecstatic Visions," looks closely at a number of Marian apparitions, i.e., claims that the Virgin Mary has appeared, often to peasant children, in such remote places as Fatima, Portugal, and Medjugorje, Yugoslavia. Also noted is the poignant Garabandal hoax in the mountains of northwestern Spain and the apparitions that showed up in the Coptic St. Mary's Church in Zeitoun, Egypt.

Nickell closes the book with a fascinating survey of a number of mystical or sanctified powers, such as luminosity, i.e., halos or radiance surrounding the head or entire body; levitation as claimed by St. Teresa or Joseph of Copertino; and bilocation, i.e., being in two places at the same time. Finally, the author takes a close look at the problem of stigmata—the duplication of the wounds attending Christ's crucifixion. All these phenomena are, to a degree, comprehensible in terms of wishful thinking and the intense fervor of belief. The phenomenon of inedia, however, which is the alleged ability to forgo all eating

and drinking, brings to mind the claims of the contemporary philosopher Wiley Brooks. Brooks argues that people only need lots of very fresh air and huge amounts of sunshine to survive and thrive. Wiley, is perhaps the chief proponent of *Breatharianism*—the belief that the human body can get along perfectly well without food, water, or sleep. Unfortunately, Brooks's top assistant deserted him a few years ago in total disillusionment. Seems he caught Brooks and other Breatharians sneaking into their rooms at night with Big Macs and other junk food.

In his summary of his lengthy search for a simple, ordinary, run-of-the-mill miracle, Nickell figuratively shakes his head and concludes that he is forced to agree with David Hume: the evidence against miracles is very strong. If we weigh the evidence that a miraculous event happened against the evidence that it did not, we invariably find that the latter evidence outweighs the former. Moreover, even though evidence in favor of miracles *might* outweigh the evidence against them, *in practice this never happens*. Hume also tells us that all claims for miracles suffer from a credibility gap, and we must face the problem of human credulity—the natural human affinity for the marvelous and our inclination toward superstition. According to the philosopher William Grey in his excellent essay "Skepticism and Miracles" (*New Zealand Skeptic*, June 1993, No. 28, pp. 1-6):

> Hume believed that the inclination of mankind towards superstition and the marvellous may receive some check from sense and learning, but he also seems to have believed that it could never be thoroughly extirpated from human nature. Hume, one suspects, would not be surprised to find beliefs in astrology, UFOs, crystals, channeling, and similar credulous ideas in the twentieth century.

Not only does Nickell agree, but in answering the question "Do miracles exist?" he cites the lack of compelling evidence for the existence of miraculous phenomena beyond the range of nature and man's natural capabilities. Nickell confidently asserts that those who claim otherwise bear the burden of proof. This burden, it appears, has not been met.

Robert A. Baker is professor emeritus of psychology at the University of Kentucky and author of Hidden Memories.

Fire in the Body?

Spontaneous Human Combustion. By Jenny Randles and Peter Hough. Dorset Press, New York, 1993. 224 pp. Hardcover, $7.98

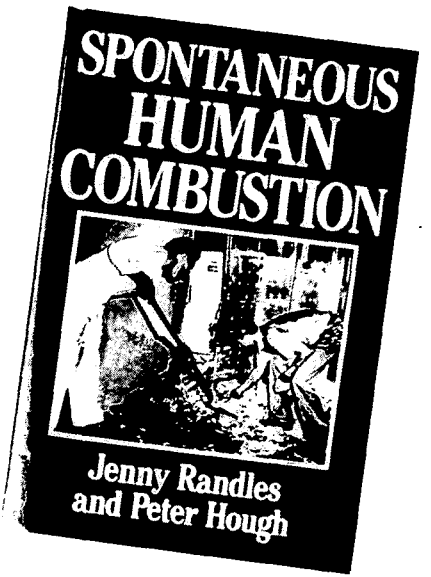
GORDON STEIN

Spontaneous human combustion (*SHC*) is supposedly the condition in which a very hot fire erupts *from the inside* of the human body, without an external source of flame. The net result, it is claimed, is a fire so hot that the body is reduced to ashes. Some of the more thoroughly

investigated cases of SHC have presented us with a body completely reduced to ashes except for a protruding hand or foot, which was left completely unburned. In addition, and perhaps most mysterious, the surrounding furniture and environment near the body were rarely damaged very much by the fire.

The current scientific thinking about SHC is that it is a physiological impossibility. The human body is 70 percent water. It does not burn spontaneously. In fact, it is really rather hard to get a human body to burn at all. At one time, it was suggested that all of the victims of SHC were alcoholics, and that it was the alcohol they had consumed that was burning. Of course, we know now that alcohol is rapidly metabolized and does not stay as alcohol in the cells of the body. In fact, modern medicine can conceive of no way by which a fire could be started *inside* the human body that would produce the incineration described. Some external energy source would be required.

Spontaneous Human Combustion, by Jenny Randles and Peter Hough, is the first real attempt at a book-length, objective treatment of the subject. (Michael Harrison's *Fire from Heaven* was not objective.) In many of the cases the authors investigated themselves, they were blocked by the coroner's office or other government offices that did not want to release information to them. Although fire departments knew of many cases that seemed to meet the definition of SHC, they (the fire departments) were extremely hesitant to call anything SHC. Rather, they (at the inquest) pressed for the verdict of accidental death or an "open" (unknown causes) verdict. Therefore, the authorities were not very likely to acknowledge that SHC might exist either.



Although Randles and Hough do not try to prove, or think they have proved, the existence of SHC, in discussing several of the more famous cases they do sweep away some of the more common objections to it. The result is to suggest that there is only a slight possibility that SHC exists. Some of the needed facts are missing, or are being hidden.

The authors do present various ideas about the possible causes of the phenomena that are supposedly observed. They recognize that the "no external source" explanation will not work, but that does not mean that they have abandoned the idea that what has been purportedly observed has not happened *with* external causes. In other words, they are looking for some external energy source that could penetrate the human body and thereby produce a very hot fire that *appeared* to come from inside the body. Among the things they consider are ball lightning, high-voltage electricity, plasmas of an electromagnetic sort, and "kundalini." This last one is thought by some to be the body's own electricity, concentrated up through the spinal column, in a way supposedly

perfected by yogas.

While none of these explanations were convincing to me, I was encouraged to see the authors trying to come up with some *rational* explanation. They completely reject supernatural or paranormal explanations, but continue to search for a physical explanation. In other words, they refuse simply to reject the existence of the phenomenon, but, being unable to conclusively demonstrate it, try to see if some explanation would at least allow the *theoretical* possibility that SHC could exist. In this attitude, we should at least see progress toward a healthy skeptical investigatory outlook. The authors conclude with a set of abstracts of 111 cases of possible spontaneous human combustion.

Although this book leaves much to be desired as a definitive work on SHC, it is by far the best treatment of the subject yet done at length. As such, it ought to be read by all interested in spontaneous human combustion, whether skeptic or not.

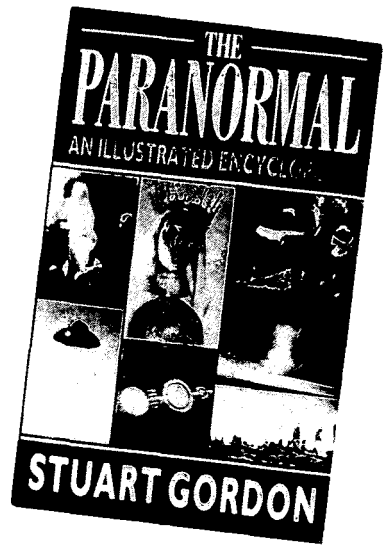
Dr. Stein is a physiologist and Scientific Consultant to CSICOP, as well as director of the Center for Inquiry Library.

A Travesty of Truth from A to Z

The Paranormal: An Illustrated Encyclopedia. By Stuart Gordon. London Headline Book Publishing, 1992. 722 pp. Paperback. Available from Barnes & Noble for $15.95.

GORDON STEIN

Because there are so few good reference works in the field, the publication of a new encyclopedia on the paranormal is a noteworthy event. Therefore, the arrival in the U.S. of the British paperback edition of Stuart Gordon's *The Paranormal: An Illustrated Encyclopedia* was an opportunity to fill an important gap in the literature. It was an opportunity completely missed, for Gordon's book is one of the most inaccurate ever written about the paranormal.



The author says that there is nothing original about the contents, that he has simply lifted the information from already published sources. I'm sure he is correct about this, but he has failed to check the *accuracy* of his sources. There is a lot of erroneous

"information" about the paranormal out there, and it should be carefully checked before becoming enshrined in an encyclopedia.

Obviously, in the examples that follow, I will be dealing only with those topics about which I know something from having written about them myself. This does *not* mean that all of the other articles, not mentioned, are any more accurate. Starting from the beginning, the article on Aura is unintelligible. The article on Cleve Backster fails to mention that no one has been able to replicate his experiments on feelings in plants. The Bermuda Triangle article mentions only Charles Berlitz's book. Annie Besant is said to have become a Theosophist because of an affair with George Bernard Shaw! She also is said to have reached the age of 90, when the (correct) dates given for her show that she did not. The article on Biorhythms is totally misinformed about the "research" that supposedly underlies the field. Madame Blavatsky is identified as a friend of Daniel Dunglas Home (whose name is consistently misspelled throughout the book). The pineal gland is said to be influenced by serotonin, which came from the bo tree, and supposedly affected the Buddha as he sat under it. The article on Cattle Mutilation is completely wrong in its conclusions and analysis. The Cottingley Fairies article fails completely to mention the *proved* fraudulence of the photos, and implies they are genuine. CSICOP gets only a short paragraph, which is negatively slanted. False statements about Houdini abound. There actually is *one* skeptical article, about the hollow earth. Then we come to the *pièce de résistance.* Can you imagine an encyclopedia article in which not one sentence is correct? Yes, Daniel Dunglas Home's *dates* are correct, but nothing else in the article is. No sources are given, of course.

Throughout, only one or two references (if any) follow each article, and these references are *never* to the skeptical literature. No skeptical literature appears in the bibliography at the end either.

Although I have taken you only through the letter "H," this travesty of truth goes on through "Z." Stay far away from this one.

Dr. Stein is the author of two encyclopedias and the director of the Center for Inquiry library.

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New Books

Ancient American Inscriptions: Plow Marks or History? William R. McGlone et al. Early Sites Research Society, P.O. Box 303, Sutton, MA 01590. 415 pp. Paper. An attempt to provide a more thoughtful, rigorous approach to the analysis of evidence for American epigraphy—the supposed identification of marks on North American rocks as messages in ancient Old World alphabets and languages. The five authors say they hope that the book will cause critics who have summarily rejected the claims of the epigraphers to take another look and advocates who have accepted them uncritically to reflect on the deficiencies and rectify them.

Great Essays in Science. Edited by Martin Gardner. Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228-2197. 427 pp. $16.95, paper. A welcome new edition of this work, intended to spread before the reader "a sumptuous feast of great writing about science." Includes essays by Isaac Asimov, Rachel Carson, Charles Darwin, Albert Einstein, Stephen Jay Gould, the Huxleys, Bertrand Russell, Carl Sagan, Lewis Thomas, H. G. Wells, and others.

Parapsychology: A Concise History. John Beloff. St. Martin's Press, New York. 330 pp. $35.00, hardcover. A parapsychologist summarizes the history of the use of scientific methods by psychical researchers of the nineteenth century and parapsychologists of the twentieth century. Probably of most interest is the second half of the book, which deals with modern developments, beginning with experimental parapsychology and Rhine's Duke experiments, through the remote-viewing experiments of the 1970s and the ganzfeld experiments of the 1980s and 1990s. Beloff's point of view is that of someone who wants to find evidence of psi but who realizes most claims fall short of demonstrating it.

Psychology, 2nd ed. Douglas A. Bernstein, Edward J. Roy, Thomas K. Srull, and Christopher D. Wickens. Houghton Mifflin, Boston, Mass. 869 pp. $51.96, hardcover. Comprehensive textbook by University of Illinois psychologists. While exploring the full range of psychology, it is designed to foster scientific attitudes and draw students' attention to the importance of critical thinking and rules for, and practice at, approaching phenomena from a scientific viewpoint. Each chapter contains a thinking critically section in which students are asked to evaluate assertions (e.g. "Can you be influenced by subliminal perceptions?") using a five-step system.

Responses to Iben Browning's Prediction of a 1990 New Madrid, Missouri, Earthquake. William Spence, et al. USGS Circular #1083. U.S. Geological Survey, Washington, D.C. 1993. 248 pp. Free from USGS, paper. When Iben Browning, inventor and business consultant, predicted an earthquake in Missouri, many things happened. Thirty TV camera crews invaded the town, T-shirts and souvenirs were sold, schools closed down, at least one man lost his job and one family their

home. What did *not* happen was the predicted earthquake. This book contains a 20-page report by geologists investigating why scientific criticism of Browning's prediction never caught up with media exploitation. The rest of the book is a fascinating set of appendices that include Browning's writings, official responses, 100 pages of press clippings, advertisements for quake-related merchandise, and preparedness literature.—*Robert Lopresti*

Science and Anti-Science. Gerald Holton. Harvard University Press, Cambridge, Mass. 203 pp. $24.95, hardcover. A Harvard physicist and science historian examines what is good science, what is the proper goal of scientific activity, what authority science may legitimately claim, and how serious a threat is posed by the antiscience movements. The final long chapter scrutinizes the "antiscience phenomenon," the increasingly common opposition to science as practiced today. (See excerpts this issue.)

Science in the New Age: The Paranormal, Its Defenders and Debunkers, and American Culture. David J. Hess. University of Wisconsin Press, Madison, Wis. 243 pp. $17.95, paper. A cultural anthropologist explores ideologies of the paranormal in the United States. He provides guidance to the views of parapsychologists and skeptical debunkers, spirit channelers and crystal healers, Hollywood script writers, and New Age prophets. In the opening chapter Hess sets the stage by examining three cultures: New Age, parapsychology, and skepticism (represented mostly by CSICOP), and he returns to this trio of cultures frequently. His viewpoint throughout is from what he calls a fourth cultural perspective: anthropologists, sociologists, culture critics, and the like, who are not explicitly aligned with one of the other three communities. While representatives of each of the three cultures may not necessarily agree with everything in the analyses presented, Hess exhibits a steady fairness and his judgments are at the least based upon close reading of the serious writings of those persons and groups he analyses.

The Sorcerer of Kings. Gordon Stein. Prometheus Books, Amherst, N.Y. 140 pp. $22.95, hardcover. An examination of the case of Daniel Dunglas Home and William Crookes. Stein takes readers inside the testing procedures of Crookes to explore just what the investigation did (and did not) entail.

Uncommon Sense: The Heretical Nature of Science. Alan Cromer. Oxford University Press, New York. $23.00, hardcover. A physicist argues that science is not the natural unfolding of human potential but the invention of a particular culture, Greece, in a particular historical time. He contends that far from being natural, scientific thinking goes so far against conventional human thinking that if it hadn't arisen in Greece, it might not have arisen at all. He sees science as a radically new and different way of thinking that provides essential ways to understand and demonstrate the counterintuitive concepts nature constantly challenges us with and for which normal human, subjective thinking is not well designed. He explains why scientific thinking didn't develop in China and India, and offers numerous other provocative ideas. A part of the chapter "Science and Nonsense," on pathological science, appeared as an article in *SI* (Summer 1993).

—*Kendrick Frazier*

Articles of Note

Argyrou, Vassos. "Under a Spell: The Strategic Use of Magic in Greek Cypriot Society." *American Ethnologist,* 20(2): 256-271, May 1993. The use of witchcraft serves nonmagical political and social goals in Cypriot society, as does the opposition to witchcraft.

Beardsley, Tim. "Fads and Feds." *Scientific American,* September 1993, pp. 39-44. News report on the clash of holistic therapy with reductionist medical science and the formation of the Office of Alternative Medicine at the National Institutes of Health.

Bernet, William. "False Statements and the Differential Diagnosis of Abuse Allegations." *Journal of the American Academy of Child and Adolescent Psychiatry,* September 1993, pp. 903-910. An attempt to provide a consistent way to classify and define the various ways in which false statements occur in allegations of abuse. Reviewing 40 articles, chapters, and books that contain examples of false statements in child-abuse contexts, the author clarifies such concepts as indoctrination, suggestion, fantasy, delusion, misinterpretation, miscommunication, innocent lying, deliberate lying, confabulation, etc.

Blinkhorn, Steve. "Extrasensory Deceptions." *Nature,* 366:382, November 25, 1993. Critical review of John Beloff's *Parapsychology: A Concise History.*

Blinkhorn, Steve. "The Writing Is on the Wall." *Nature,* 366:208, November 18, 1993. Critical review of graphology claims. Keyed to a statement issued November 18 by the British Psychological Society that presents a highly negative picture of the value of graphology in personnel assessment.

Crews, Frederick. "The Unknown Freud." *New York Review of Books,* November 18, 1993, pp. 55-66. Long essay review providing critical reevaluation of Freud and Freudian psychoanalytic therapy.

Damphousse, Kelly R., and Ben M. Crouch. "Did the Devil Make Them Do It? An Examination of the Etiology of Satanism Among Juvenile Delinquents." *Youth and Society,* 24(2): 204-227, December 1992. High attachment to peers was the factor that most distinguished juvenile delinquents who reported involvement in Satanism from those who did not. Being white, above average in intelligence, and having weak attachment to parents, were lesser but significant factors.

Drucker, Barry J., and Dan W. Knox. "The Blob: Investigating the Abnormal." *Journal of Environmental Health,* 56(2): 19-23, September 1993. When a bizarre lump of tissue was discovered in a glass jar near a Missouri stream, scientists were unable to identify it. Careful management of publicity allowed the health department to discover its nature (plant bacteria) and origin (a restaurant) without creating a media circus.

Duncan, Kirsty. "Was Ergotism Responsible for the Scottish Witch-hunts?" *Area*, 25(1): 30-36, March 1993. Ergot poisoning from rye fungus has been implicated in the Salem witch trials. Agricultural and medical records do not support such a connection with seventeenth-century Scottish witch frenzies, but other fungal ailments might be involved.

Goodstein, David L. "Scientific Elites and Scientific Illiterates." *Engineering & Science* (Caltech), Spring 1993, pp. 23-31. Explores how it is that our apparently miserable education system has produced such a brilliant community of scientists. The author refers to this as the "Paradox of the Scientific Elites and the Scientific Illiterates." "We have created a kind of feudal aristocracy in American science, where a privileged few hold court, while the toiling masses huddle in darkness, metaphorically, of course."

Gray, Paul. "The Assault on Freud." *Time*, November 29, 1993, pp. 46-51. Cover article explores the forces undermining Freudianism, "this troubled century's dominant model for thinking and talking about human behavior." This good, balanced article summarizes all the difficulties confronting Freudian foundations while quoting others who contend Freud's impact and importance remain strong.

Grey, William. "Hume, Miracles and the Paranormal." *Cognito*, 7(2): 100-118, Summer 1993. Philosopher says some of David Hume's arguments developed two and a half centuries ago bear directly on some of the problems today in evaluating conflicting testimony about psychic and paranormal claims.

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whose mother and stepfather withheld medical care in favor of Christian Science prayer.

Slakey, Francis. "When the Lights of Reason Go Out." *New Scientist*, September 11, 1993, pp. 49-50. Urgent lament about the antiscience fantasies of educated, intelligent people. There is "an elegant and modern fashion in thought: reject objective reason and question the value of science, embrace subjectivity and trust your feelings. According to antiscience intellectuals, contemporary science has taken us maddeningly close to the edge of the abyss. . . . But it is the abandonment of objectivity, not the practice of science which leads to the abyss." Asks Slakey: "How can we possibly prevent the death of reason? . . . We must defend science against superstition and subjectivity, and elevate skepticism over faith. We must demand rigorous explanations and be prepared and eager to doubt them. Only alert objectivity can prevent the death of reason."

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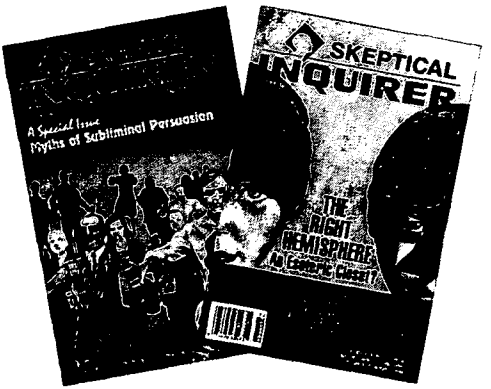

WINTER 1994 (vol. 18, n. 2): The New Skepticism, *Kurtz.* Philosophy and the Paranormal, Part 1: The problem of 'psi,' *Grey.* Electromagnetic field cancer scares, *Deutsch.* Attacks on role-playing games, *Cardwell.* Global fortune-telling and Bible prophecy, *Tremaine.* Chernikov pattern puzzle, *Pickover.*

FALL 1993 (vol. 18, no. 1): 'Perspectives on education in America': Sandia study challenges misconceptions, *Frazier.* Do 'honesty' tests really measure honesty? *Lilienfeld.* Astrology strikes back—but to what effect? *Dean.* Diagnoses of alien kidnappings that result from conjunction effects in memory, *Dawes and Mulford.* Mathematical magic for skeptics, *Benjamin and Shermer.* The blind girl who saw the flash of the first nuclear weapon test, *Sinclair.* Science: The feminists' scapegoat? *Walker.*

SUMMER 1993 (vol. 17, no. 4): The right hemisphere: An esoteric closet? *Saraví.* Improving science teaching: The textbook problem, *Padian.* The eyewitness: Imperfect interface between stimuli and story, *Reich.* Pathological science: An update, *Cromer.* Jack Horkheimer, "Star Hustler," *interview by Gabriel Seabrook.* The false memory syndrome, *Gardner.*

SPRING 1993 (vol. 17, no. 3): Anguished silence and helping hands: Autism and Facilitated Communication, *Mulik, Jacobson, and Kobe.* Faciliated Communication, Autism, and Ouija, *Dillon.* Treading on the edge: Practicing safe science with SETI, *Tarter.* Education for science, *Gore.* A threat to science, *Schatzman.* Charles Honorton's legacy to parapsychology, *Blackmore.* 1993 CSICOP Conference.

WINTER 1993 (vol. 17, no. 2): Special report: 3.7 million Americans kidnapped by aliens? *Stires and Klass.* Psychics: Do police departments really use them? *Sweat and Durm.* Psychic detectives: A critical examination, *Walter Rowe.* Therapeutic Touch, *Bullough and Bullough.* Improving science teaching in the U.S., *Marek and Wayne Rowe.* The Big Sur 'UFO,' *George.* The strange case of the New Haven oysters, *Quincey.*

FALL 1992 (vol. 17, no. 1): A celebration of Isaac Asimov: A man for the universe, *Kendrick Frazier, Arthur C. Clarke, Frederik Pohl, Harlan Ellison, L. Sprague de Camp, Carl Sagan, Stephen Jay Gould, Martin Gardner, Paul Kurtz, Donald Goldsmith, James Randi, and E. C. Krupp.* Gaia without mysticism, *Shannon.* Gaia's scientific coming of age, *Frazier.* The curse of the runestone: Deathless hoaxes, *Whittaker.* Night terrors, sleep paralysis, and devil-stricken telephone cords from hell, *Huston.* Scientific creationism: The social agenda of a pseudoscience, *Shore.* Observing stars in the daytime: The chimney myth, *Sanderson.* Does an ancient Jewish amulet commemorate the conjunction of 2 B.C.? *Rubincam.*

SUMMER 1992 (vol. 16, no. 4): Freedom of scientific inquiry under siege, Kurtz. Psychic experiences: Psychic illusions, *Blackmore.* The scientist's skepticism, *Bunge.* The persistent popularity of the paranormal, *Lett.* Self-help books: Pseudoscience in the guise of science? *Gambrill.*

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FALL 1991 (vol. 16, no. 1): Near-death experiences, *Blackmore.* Multicultural pseudoscience: Spreading scientific illiteracy, Part 1, *de Montellano.* Science and commonsense skepticism, *Aach.* Spook Hill, *Wilder.* Lucian and Alexander, *Rowe.* 1991 CSICOP conference, *Shore* and *Frazier.*

SUMMER 1991 (vol. 15, no. 4): Lucid dreams, *Blackmore.* Nature faking in the humanities, *Gallo.* Carrying the war into the never-never land of psi: Part 2, *Gill.* Coincidences, *Paulos.* Locating invisible buildings, *Plummer.* True believers, *Bower.*

SPRING 1991 (vol. 15, no. 3): Special report: Hi-fi pseudoscience, *Davis.* Searching for extraterrestrial intelligence: An interview with *Thomas R. McDonough.* Getting smart about getting smarts, *Faulkes.* Carrying the war into the never-never land of psi: Part 1, *Gill.* Satanic cult 'survivor' stories, *Victor.* 'Old-solved mysteries': The Kecksburg incident, *Young.* Magic, medicine, and metaphysics in Nigeria, *Roder.* What's wrong with science education? Look at the family, *Eve.*

WINTER 1991 (vol. 15, no. 2): Special report / Gallup poll: Belief in paranormal phenomena, *Gallup and Newport.* Science and self-government, *Piel.* West Bank collective hysteria episode, *Stewart.* Acceptance of personality test results, *Thiriart.* Belief in astrology: A test of the Barnum effect, *French, Fowler, McCarthy, and Peers.* A test of clairvoyance using signal-detection, *McKelvie and Gagné.* Intercessory prayer as medical treatment? *Wittmer and Zimmerman.*

FALL 1990 (vol. 15, no. 1): Neural Organization Technique: Treatment or torture, *Worrall.* The spooks of quantum mechanics, *Stenger.* Science and Sir William Crookes, *Hoffmaster.* The 'N' machine, *Cumming.* Biological cycles and rhythms vs. biorhythms, *Wheeler.* 1990 CSICOP Conference.

(continued on next page)

SUMMER 1990 (vol. 14, no. 4): Ghosts make news: How four newspapers report psychic phenomena, *Klare.* Thinking critically and creatively, *Wade and Tavris.* Police pursuit of satanic crime, Part 2, *Hicks.* Order out of chaos in survival research, *Berger.* Piltdown, paradigms, and the paranormal, *Feder.* Auras: Searching for the light, *Loftin.*

SPRING 1990 (vol. 14, no. 3): Why we need to understand science, *Sagan.* The crisis in pre-college science and math education, *Seaborg.* Police pursuit of satanic crime, Part 1, *Hicks.* The spread of satanic-cult rumors, *Victor.* Lying about polygraph tests, *Shneour.* Worldwide disasters and moon phase, *Kelly, Saklofske, and Culver.*

WINTER 1990 (vol. 14, no. 2): The new catastrophism, *Morrison and Chapman.* A field guide to critical thinking, *Lett.* Cold fusion: A case history in 'wishful science'? *Rothman.* The airship hysteria of 1896-97,*Bartholomew.* Newspaper editors and the creation-evolution controversy, *Zimmerman.* Special report: New evidence of MJ-12 hoax, *Klass.*

FALL 1989 (vol. 14, no. 1): Myths about science, *Rothman.* The relativity of wrong, *Asimov.* Richard Feynman on fringe science. Luis Alvarez and the explorer's quest, *Muller.* The two cultures, *Jones.* The 'top-secret UFO papers' NSA *won't* release, *Klass.* The metaphysics of Murphy's Law, *Price.*

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SPRING 1989 (vol. 13, no. 3): High school biology teachers and pseudoscientific belief, *Eve and Dunn.* Evidence for Bigfoot? *Dennett.* Alleged pore structure in Sasquatch footprints, *Freeland and Rowe.* The lore of levitation, *Stein.* Levitation 'miracles' in India, *Premanand.* Science, pseudoscience, and the cloth of Turin, *Nickell.* Rather than just debunking, encourage people to think, *Seckel.* MJ-12 papers 'authenticated'? *Klass.* A patently false patent myth, *Sass.*

WINTER 1989 (vol. 13, no. 2): Special report: The 'remembering water' controversy, *Gardner and Randi;* Bibliographic guide to the 'dilution controversy.' Pathologies of science, precognition, and modern psychophysics, *Jensen.* A reaction-time test of ESP and precognition, *Hines and Dennison.* Chinese psychic's pill-bottle demonstration, *Wu Xiaoping.* The Kirlian technique, *Watkins and Bickel.* Certainty and proof in creationist thought, *Leferrière.*

FALL 1988 (vol. 13, no. 1): Special report: Astrology and the presidency, *Kurtz* and *Bob.* Improving Human Performance: What about parapsychology? *Frazier.* The China syndrome: Further reflections on the paranormal in China, *Kurtz.* Backward masking, *McIver.* The validity of graphological analysis, *Furnham.* The intellectual revolt against science, *Grove.*

SUMMER 1988 (vol. 12, no. 4): Testing psi claims in China, *Kurtz, Alcock, Frazier, Karr, Klass, and Randi.* The appeal of the occult: Some thoughts on history, religion, and science, *Stevens.* Hypnosis and reincarnation, *Venn.* Pitfalls of perception, *Wheeler.* Wegener and pseudoscience: Some misconceptions, *Edelman.* An investigation of psychic crime-busting, *Emery.* High-flying health quackery, *Hines.* The bar-code beast, *Keith.*

SPRING 1988 (vol. 12, no. 3): Neuropathology and the legacy of spiritual possession, *Beyerstein.* Varieties of alien experience, *Ellis.* Alien-abduction claims and standards of inquiry (excerpts from Milton Rosenberg's radio talk-show with guests Charles Gruder, Martin Orne, and Budd Hopkins). The MJ-12 Papers: Part 2, *Klass.* Doomsday: The May 2000 prediction, *Meeus.* My visit to the Nevada Clinic, *Barrett.* Morphic resonance in silicon chips, *Varela and Letelier.* Abigail's anomalous apparition, *Durm.* The riddle of the Colorado ghost lights, *Bunch and White.*

WINTER 1987-88 (vol. 12, no. 2): The MJ-12 papers: Part I, *Philip J. Klass.* The aliens among us: Hypnotic regression revisited, *Baker.* The brain and consciousness: Implications for psi, *Beyerstein.* Past-life hypnotic regression, *Spanos.* Fantasizing under hypnosis, *Reveen.* The verdict on creationism, *Gould.*

FALL 1987 (vol. 12, no. 1): The burden of skepticism, *Sagan.* Is there intelligent life on Earth? *Kurtz.* Medical Controversies: Chiropractic, *Jarvis;* Homeopathy, *Barrett, M.D.;* Alternative therapies, *Jones;* Quackery, *Pepper.* Catching Geller in the act, *Emery.* Special Report: CSICOP's 1987 conference.

SUMMER 1987 (vol. 11, no. 4): Incredible cremations: Investigating combustion deaths, *Nickell and Fischer.* Subliminal deception, *Creed.* Past tongues remembered? *Thomason.* Is the universe improbable? *Shotwell.* Psychics, computers, and psychic computers, *Easton.* Pseudoscience and children's fantasies, *Evans.* Thoughts on science and superstrings, *Gardner.* Special Reports: JAL pilot's UFO report, *Klass;* Unmasking psychic Jason Michaels, *Busch.*

SPRING 1987 (vol. 11, no. 3): The elusive open mind: Ten years of negative research in parapsychology, *Blackmore.* Does astrology need to be true? Part 2: The answer is no, *Dean.* Magic, science, and metascience: Some notes on perception, *D. Sagan.* Velikovsky's interpretation of the evidence offered by China, *Lo.*

WINTER 1986-87 (vol. 11, no. 2): Case study of West Pittston 'haunted' house, *Kurtz.* Science, creationism and the Supreme Court, *Seckel,* with statements by *Ayala, Gould,* and *Gell-Mann.* The great East Coast UFO of August 1986, *Oberg.* Does astrology need to be true? Part 1, *Dean.* Homing abilities of bees, cats, and people, *Randi.*

FALL 1986 (vol. 11, no. 1): The path ahead: Opportunities, challenges, and an expanded view, *Frazier.* Exposing the faith-healers, *Steiner.* Was Antarctica mapped by the ancients? *Jolly.* Folk remedies and human belief-systems, *Reuter.* Dentistry and pseudoscience, *Dodes.* Atmospheric electricity, ions, and pseudoscience, *Dolezalek.* Noah's ark and ancient astronauts, *Harrold and Eve.* The Woodbridge UFO incident, *Ridpath.* How to bust a ghost, *Baker.*

SUMMER 1986 (vol. 10, no. 4): Occam's razor, *Shneour.* Clever Hans redivivus, *Sebeok.* Parapsychology miracles, and repeatability, *Flew.* The Condon UFO study, *Klass.* Four decades of fringe literature, *Dutch.* Some remote-viewing recollections, *Weinberg.*

SPRING 1986 (vol. 10, no. 3): The perennial fringe, *Asimov.* The uses of credulity, *de Camp.* Night walkers and mystery mongers, *Sagan.* CSICOP after ten years, *Kurtz.* Crash of the crashed-saucers claim, *Klass.* A study of the Kirlian effect, *Watkins and Bickel.* Ancient tales and space-age myths of creationist evangelism, *McIver.*

WINTER 1985-86 (vol. 10, no. 2): The moon was full and nothing happened, *Kelly, Rotton, and Culver.* Psychic studies: The Soviet dilemma, *Ebon.* The psychopathology of fringe medicine, *Sabbagh.* Computers and rational thought, *Spangenburg and Moser.*

FALL 1985 (vol. 10, no. 1): Investigations of firewalking, *Leikind and McCarthy.* Firewalking: reality or illusion, *Dennett.* Myth of alpha consciousness, *Beyerstein.* Spirit-rapping unmasked, *V. Bullough.* The Saguaro incident, *Taylor and Dennett.*

SUMMER 1985 (vol. 9, no. 4): Guardian astrology study, *Dean, Kelly, Rotton, and Saklofske.* Astrology and the commodity market, *Rotton.* The hundredth monkey phenomenon, *Amundson.* Responsibilities of the media, *Kurtz.* 'Lucy' out of context, *Albert.*

SPRING 1985 (vol. 9, no. 3): Columbus poltergeist: I, *Randi.* Moon and murder in Cleveland, *Sanduleak.* Image of Guadalupe, *Nickell and Fischer.* Radar UFOs, *Klass.* Phrenology, *McCoy.* Deception by patients, *Pankratz.* Communication in nature, *Orstan.*

WINTER 1984-85 (vol. 9, no. 2): The muddled 'Mind Race,' *Hyman.* Searches for the Loch Ness monster, *Razdan and Kielar.* Final interview with Milbourne Christopher, *Dennett.* Retest of astrologer John McCall, *Ianna and Tolbert.*

FALL 1984 (vol. 9, no. 1): Quantum theory and the paranormal, *Shore.* What is pseudoscience? *Bunge.* The new philosophy of science and the 'paranormal,' *Toulmin.* An eye-opening double encounter, *Martin.* Similarities between identical twins and between unrelated people, *Wyatt et al.* Effectiveness of a reading program on paranormal belief, *Woods,* Pseudoscientific beliefs of 6th-graders, *A. S. and S. J. Adelman.*

SUMMER 1984 (vol. 8, no. 4): Parapsychology's past eight years, *Alcock.* The evidence for ESP, *C. E. M. Hansel.* $110,000 dowsing challenge, *Randi.* Sir Oliver Lodge and the spiritualists, *Hoffmaster.* Misperception, folk belief, and the occult, *Connor.* Psychology and UFOs, *Simón.*

SPRING 1984 (vol. 8, no. 3): Belief in the paranormal worldwide: Mexico, *Mendez-Acosta;* Netherlands, *Hoebens;* U.K., *Hutchinson;* Australia, *Smith;* Canada, *Gordon;* France, *Rouzé.* Debunking, neutrality, and skepticism in science, *Kurtz.* University course reduces paranormal belief, *Gray.* The Gribbin effect, *Roder.* Proving negatives, *Pasquarello.*

WINTER 1983-84 (vol. 8, no. 2): Sense and nonsense in parapsychology, *Hoebens.* Magicians, scientists, and psychics, *Ganoe and Kirwan.* New dowsing experiment, *Martin.* The effect of TM on weather, *Trumpy.* The haunting of the Ivan Vassilli, *Sheaffer.* Venus and Velikovsky, *Forrest.*

FALL 1983 (vol. 8, no. 1): Creationist pseudoscience, *Schadewald.* Project Alpha: Part 2, *Randi.* Forecasting radio quality by the planets, *Dean.* Reduction in paranormal belief in college course, *Tobacyk.* Humanistic astrology, *Kelly and Krutzen.*

SUMMER 1983 (vol. 7, no. 4): Project Alpha: Part 1, *Randi.* Goodman's 'American Genesis,' *Feder.* Battling on the airwaves, *Slavsky.* Rhode Island UFO film, *Emery.*

SPRING 1983 (vol. 7, no. 3): Iridology, *Worrall.* The Nazca drawings revisited, *Nickell. People's Almanac* predictions, *Donnelly.* Test of numerology, *Dlhopolsky.* Pseudoscience in the name of the university, *Lederer and Singer.*

WINTER 1982-83 (vol. 7, no. 2): Palmistry, *Park.* The great SRI die mystery, *Gardner.* The 'monster' tree-trunk of Loch Ness, *Campbell.* UFOs and the not-so-friendly skies, *Klass.* In defense of skepticism, *Reber.*

FALL 1982 (vol. 7, no. 1): The prophecies of Nostradamus, *Cazeau.* Prophet of all seasons, *James Randi.* Revival of Nostradamitis, *Hoebens.* Unsolved mysteries and extraordinary phenomena, *Gill.* Clearing the air about psi, *Randi.* A skotography scam, *Randi.*

SUMMER 1982 (vol. 6, no. 4): Remote-viewing, *Marks.* Radio disturbances and planetary positions, *Meeus.* Divining in Australia, *Smith.* "Great Lakes Triangle," *Cena.* Skepticism, closed-mindedness, and science fiction, *Beyerstein.* Followup on ESP logic, *Hardin and Morris* and *Gendin.*

SPRING 1982 (vol. 6, no. 3): The Shroud of Turin, *Mueller.* Shroud image, *McCrone.* Science, the public, and the Shroud, *Schafersman.* Zodiac and personality, *Gauquelin.* Followup on quantum PK, *Hansel.*

WINTER 1981-82 (vol. 6, no. 2): On coincidences, *Ruma Falk.* Croiset: Part 2, *Hoebens.* Scientific creationism, *Schadewald.* Follow-up on 'Mars effect,' *Rawlins,* responses by *CSICOP Council* and *Abell and Kurtz.*

FALL 1981 (vol. 6, no. 1): Gerard Croiset: Part 1, *Hoebens.* Test of perceived horoscope accuracy, *Lackey.* Planetary positions and radio propagation, *Ianna and Margolin.* Bermuda Triangle, 1981, *Dennett.* Observation of a psychic, *McIntyre.*

SUMMER 1981 (vol. 5, no. 4): Investigation of 'psychics,' *Randi.* ESP: A conceptual analysis, *Gendin.* The extroversion-introversion astrological effect, *Kelly and Saklofske.* Art, science, and paranormalism, *Habercom.* Profitable nightmare, *Wells.* A Maltese cross in the Aegean? *Loftin.*

SPRING 1981 (vol. 5, no. 3): Hypnosis and UFO abductions, *Klass.* Hypnosis not a truth serum, *Hilgard.* H. Schmidt's PK experiments, *Hansel.* Further comments on Schmidt's experiments, *Hyman.* Atlantean road, *Randi.* Deciphering ancient America, *McKusick.* A sense of the ridiculous, *Lord.*

WINTER 1980-81 (vol. 5, no. 2): Fooling some people all the time, *Singer and Benassi.* Recent perpetual motion developments, *Schadewald.* National Enquirer astrology study, *Mechler, McDaniel, and Mulloy.* Science and the mountain peak, *Asimov.*

FALL 1980 (vol. 5, no. 1): The Velikovsky affair — articles by *Oberg, Bauer, Frazier.* Academia and the occult, *Greenwell.* Belief in ESP among psychologists, *Padgett, Benassi, and Singer.* Bigfoot on the loose, *Kurtz.* Parental expectations of miracles, *Steiner.* Downfall of a would-be psychic, *McBurney and Greenberg.* Parapsychology research, *Mishlove.*

SUMMER 1980 (vol. 4, no. 4): Superstitions, *Bainbridge and Stark.* Psychic archaeology, *Feder.* Voice stress analysis, *Klass.* Follow-up on the 'Mars effect,' Evolution vs. creationism, and the Cottrell tests.

SPRING 1980 (vol. 4, no. 3): Belief in ESP, *Morris.* UFO hoax, *Simpson.* Don Juan vs. Piltdown man, *de Mille.* Tiptoeing beyond Darwin, *Greenwell.* Conjurors and the psi scene, *Randi.* Follow-up on the Cottrell tests.

WINTER 1979-80 (vol. 4, no. 2): The 'Mars effect' — articles *by Kurtz, Zelen, and Abell; Rawlins; Michel and Françoise Gauquelin.* How I was debunked, *Hoebens.* The metal bending of Professor Taylor, *Gardner.* Science, intuition, and ESP, *Bauslaugh.*

FALL 1979 (vol. 4, no. 1): A test of dowsing, *Randi.* Science and evolution, *Godfrey.* Television pseudodocumentaries, *Bainbridge.* New disciples of the paranormal, *Kurtz.* UFO or UAA, *Standen.* The lost panda, *van Kampen.* Edgar Cayce, *Randi.*

SUMMER 1979 (vol. 3, no. 4): The moon and the birthrate, *Abell and Greenspan.* Biorhythms, *Hines.* 'Cold reading,' *Randi.* Teacher, student, and the paranormal, *Kral.* Encounter with a sorcerer, *Sack.*

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FALL 1978 (vol. 3, no. 1): An empirical test of astrology, *Bastedo.* Astronauts and UFOs, *Oberg.* Sleight of tongue, *Schwartz.* The Sirius "mystery," *Ridpath.*

SPRING/SUMMER 1978 (vol. 2, no. 2): Tests of three psychics, *Randi.* Biorhythms, *Bainbridge.* Plant perception, *Kmetz.* Anthropology beyond the fringe, *Cole.* NASA and UFOs, *Klass.* A second Einstein ESP letter, *Gardner.*

FALL/WINTER 1977 (vol. 2, no. 1): Von Däniken, *Story,* The Bermuda Triangle, *Kusche.* Pseudoscience at Science Digest, *Oberg and Sheaffer.* Einstein and ESP, *Gardner.* N-rays and UFOs, *Klass.* Secrets of the psychics, *Rawlins.*

SPRING/SUMMER 1977 (vol. 1, no. 2): Uri Geller, *Marks and Kammann.* Cold reading, *Hyman.* Transcendental Meditation, *Woodrum.* A statistical test of astrology, *McGervey.* Cattle mutilations, *Stewart.*

FALL/WINTER 1976 (vol. 1, no. 1): Dianetics, *Wallis.* Psychics and clairvoyance, *Fine.* "Objections to Astrology," *Westrum.* Astronomers and astrophysicists as astrology critics, *Kurtz and Nisbet.* Biorhythms and sports, *Fix.* Von Däniken's chariots, *Omohundro.*

Follow-up

It's All an Illusion! And Here's How It's Done

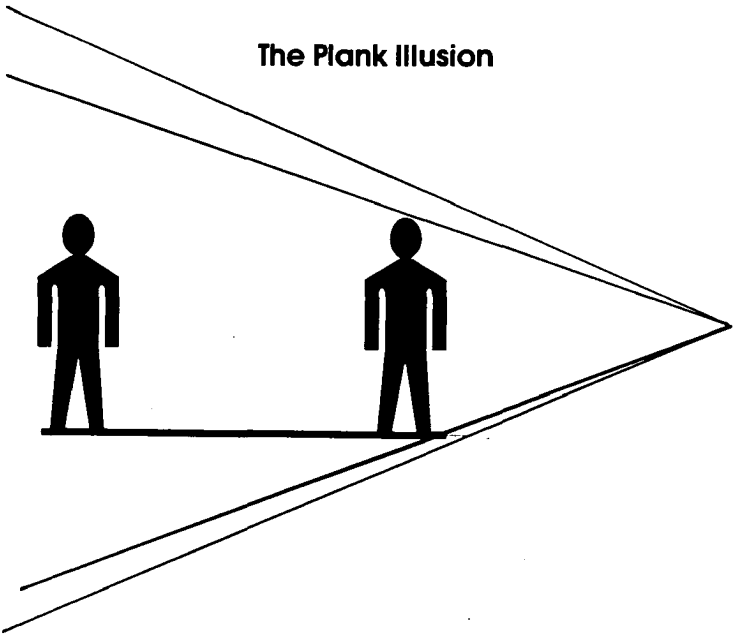
RAY HYMAN

A news article in the Winter 1993 SKEPTICAL INQUIRER (pp. 127-128) gave an account of CSICOP's "Skeptic's Toolbox" workshop/seminar I had hosted in Eugene, Oregon. The article was illustrated by photographs of two illusions—Jerry Andrus's "The Impossible Box" and the "Oregon Vortex Plank Illusion"—erected in a park in Eugene for the workshop. Judging from the mail I received, readers found the photos, to say the least, intriguing, even baffling. Some found them frustrating. Several felt shortchanged because the article hadn't provided an explanation and wrote asking the SKEPTICAL INQUIRER to provide one.

Here are the explanations for the Oregon Vortex Illusion and the Impossible Box.

I hope the explanation, photographs, and diagrams by Jerry Andrus on the following pages will make clear the secret behind the impossible crate. Jerry created and built this crate to

The camera used for this photo was on a tripod and not moved between taking the first photo and taking the second. The plank is level. All that took place between the two exposures was that the two people changed places on the plank. (Photos by George Andrus.)



The person on the left is the same size as the person on the right. The diagonal lines simulate the type of background that confronts the eye when a level surface is surrounded by sloping ground and obscured horizons. Under these conditions the perceptual system tends to treat the assumed horizon and ground as level and adjusts other objects accordingly.

accompany an article about him that appeared in the May 1981 *Omni* magazine.

The most striking phenomenon at the House of Mystery at the Oregon Vortex is the apparent change in height of an individual as she or he walks from one end to the other on a short, level plank. Jerry Andrus has found that he can duplicate this effect in any wooded area that has a sloping surface. Jerry has supplied diagrams and explanations to account for *two* of the three separate illusions involved.

The proponents of the paranormality of this phenomenon have always argued that the photographic evidence shows that it is not an illusion. The heights show a measurable change on the photograph. As Jerry has shown, simply because one end of the plank is physically closer to the camera lens. When care is taken to make sure that the lens is the same distance from each end of the plank, the person's size does not change on the photograph regardless of where he or she is on the plank.

Two reasons account for the fact that visitors to the House of Mystery get the photographic effect. One is that the situation is such that it is almost physically impossible to place the camera dead center. The other reason is that, because of the optical illusion that I will describe, people mistakenly believe their camera is dead center when it is not. You have to carefully use good measuring instruments to get the camera exactly centered.

Jerry also describes why the two people on the plank perceive a change in their respective heights as they exchange places. The ground under the level plank slopes. Persons standing on this ground tend to perceive it as level.

(continued on p. 318)

Explanation of the Impossible Box and the Plank Illusion

JERRY ANDRUS

The picture of the person in a "crate" is an example showing that our point of view influences what we believe we see. We "see" by the interpretation that our minds put on the signals that come from the retina.

From the view of the original photo our minds "see" a person in a sort of box framework. Looking closer, we see that there is a paradox as the left front upright board seems to be behind the back horizontal one. Likewise, the right rear upright seems to be in front of the front horizontal board.

The paradox is more puzzling when we are told that there is no retouching or trick photography. If you had been there looking from the camera position, it would have looked to you like the "Impossible Box" that the picture shows.

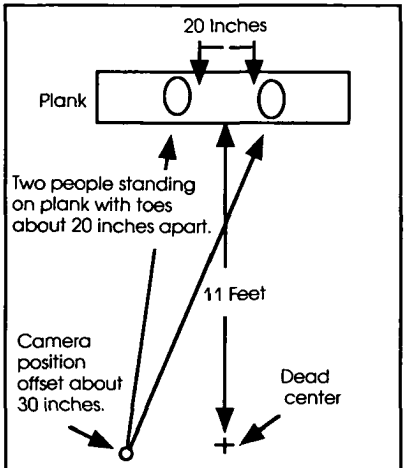
With the person in the same position as in the first picture, if you had seen it from this other angle it would look nothing like a box framework, but exactly like what it really is, an odd arrangement of two-by-fours.

Note that one of the ropes is held out with a stiff rod behind the lower part. In the other picture it looks as though it is bent over the front horizontal board. The actual bend, as you can see, is out in thin air, near nothing. So, in this case, point of view is everything!

Also see the drawing of the crate. It will help give a better idea of how the ends will look as though they fit the corners when viewed from the proper distance and angle.

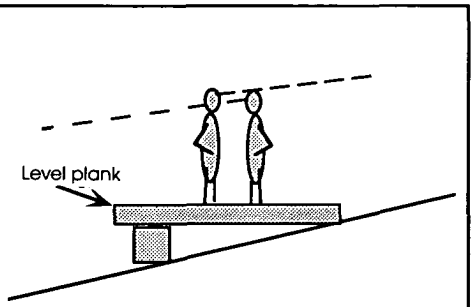
Jerry Andrus is a magician, inventor, and iconoclast. He lives in Albany, Oregon, in a Charles Addams–style house that he calls the Castle of Chaos. Jerry performs only magic effects that he has personally created. Martin Gardner has written that Jerry is the only magician who can consistently fool other magicians. He has invented many optical illusions, some of which are on exhibit in museums around the world.

Details on method used to set up scene to photograph two people on a level plank who apparently change relative height by merely changing places on the plank. The photos will show it "true." To the people on the plank it will look true. Is it some strange vortex or optical illusion or what? The basic explanation is that the one person is closer to the camera than the other and thus will be taller in the picture when he is on the end of the plank that is closer to the camera, etc.


20 Inches
Plank
Two people standing on plank with toes about 20 inches apart.
11 Feet
Camera position offset about 30 inches.
Dead center

Camera on tripod with lens about 3 feet above level of plank. With camera in this position it is closer to the person on the left, so he or she will be larger in the picture.

The camera was tipped a little so that the plank was square with the picture.



Plank blocked up level on hillside where the two people can see both down and up the hill some distance.

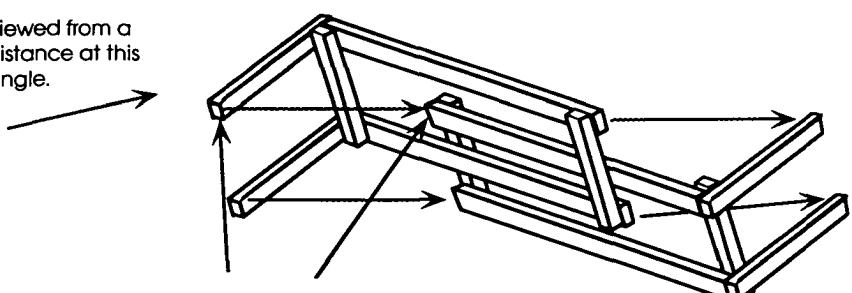
When the uphill person is asked to look straight ahead and say where his eyes hit on the other person, he will misjudge and be looking downhill some, thinking that he is looking straight ahead.

The opposite is true for the person looking uphill.

Thus, if the camera is set up as shown, the people on the plank will have the same illusion as the picture will show.

Impossible Box
By Jerry Andrus

Viewed from a distance at this angle.



This end of this board will seem to fit this corner of the framework, etc.

(continued from p. 315)

Their line of sight tends to parallel the slope of the ground. When someone is on the downhill side of the plank from them, this would result in their looking at the person at a spot much lower than if they were on level ground. If the people are actually the same height, this results in the person on the uphill side of the plank looking below the downhill person's eye-level. The downhill person thus looks taller. On the other hand the downhill person is now looking above the uphill person's eye-level, making the uphill person seem smaller.

A third explanation accounts for why observers who are not on the plank also see an apparent change in height as the two people on the plank exchange places. The illustration that I have labeled "The Plank Illusion" shows why this is so. The sloping hill along with a sloping background or obscured true horizon creates an optical illusion for the observers. I have indicated how this works by adding a few sloping lines. This particular form of the illusion is known as the "Ponzo Illusion."

The three different explanations for the illusion probably account for why so many otherwise knowledgeable individuals have been baffled by the Plank Illusion. Depending on the arrangement of the camera and the background, the three separate effects can be consistent with each other or one of them can produce the illusion in an opposite direction from the other two.

Ray Hyman is a professor of psychology at the University of Oregon and a CSICOP Fellow who specializes in understanding how our minds work to deceive us.

Skeptic Wanted

CSICOP is soliciting applications from committed skeptics who would like to work for CSICOP and the SKEPTICAL INQUIRER. Junior staff position now open; responsibilities involve all aspects of our publishing and outreach efforts. High growth potential. Salary open to negotiation. Please send resume and salary requirements in confidence to:

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CSICOP
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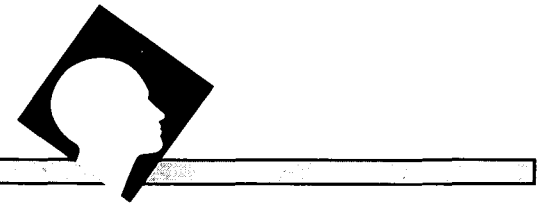
Buffalo NY 14226-0703

Letters to the Editor



Honesty tests

I am generally inclined to respond to specific criticisms regarding integrity tests on an issue-by-issue basis. However, the article—or more accurately, "polemic"—entitled "Do 'Honesty' Tests Really Measure Honesty?" (*SI*, Fall 1993) is so inaccurate, outdated, and biased that such a response would be voluminous. I am compelled, however, to offer the following *current facts* regarding integrity tests.

1. The vast majority of integrity tests that are sold (85% or more) are developed and validated by industrial and/or measurement psychologists who are members of the American Psychological Association (APA). Mainly through the work of these psychologists and other recognized experts, in conjunction with the Association of Personnel Test Publishers, the *Model Guidelines for Pre-employment Integrity Testing Programs* were developed and published in 1990. These *Guidelines* provide publishers and users with specific standards regarding test development, validation, use, interpretation, marketing, etc.

2. Companies and universities commonly pay technical experts (chemists, biologists, physicians, etc.) to conduct research and development on products, including industrial/measurement psychologists for the purpose of internal test development and use. Regardless of their affiliation (test publisher or other organization), all psychologists are obligated to adhere to a number of guidelines, including but not limited to the APA's *Standards for Educational and Psychological Testing* and the *Principles for the Validation and Use of Personnel Selection Procedures.*

All psychologists must also comply with the *Ethical Principles of Psychologists.*

3. In the past, there has been little interest in integrity-testing research by those outside the personnel-testing industry. Such lack of interest has created the impression that test publishers discourage outside research. However, with the increased media attention on the subject of personnel testing in general, as well as integrity testing, there seems to be a greater interest in this area from academic researchers, which reputable test publishers have welcomed and supported. Furthermore, as any competent research psychologist knows, specific knowledge regarding a test's key is not imperative to conducting validation research.

4. A basic issue of selection is: Which test/technique results in the lowest level of classification errors? Robert Guion, a prominent personnel psychologist, has asserted that "while integrity tests are far from perfect, they are better than any available alternative for screening and selecting honest job applicants." An APA task force concurred in their report titled *Questionnaires Used in the Prediction of Trustworthiness in Pre-employment Selection Decisions,* wherein they recognized the validity of integrity tests and stated: "We do not believe there is any sound basis for prohibiting their [integrity tests'] development and use; indeed to do so would only invite alternative forms of pre-employment screening that would be less open, scientific, and controllable." Moreover, in a letter describing this study, the APA stated: "In reviewing nearly 200 studies and other documents, it is apparent that the industry leaders have already produced a scientific level of evidence for integrity tests parallel to that accepted for other tests and instruments."

I trust I have introduced a modicum of current fact-based information to your readership whereby they may recognize the prior article for what it

is—a diatribe developed to support a pre-existing opinion of integrity testing. Should your readers be interested in further *factual or scientific information*, I would recommend that they contact the Association of Test Publishers (a Washington, D.C.-based trade association) or the APA Science Directorate.

David W. Arnold
Vice President, Research
Reid Psychological Systems
Chicago, Ill.

Kudos to Scott Lilienfeld for having asked, Do "honesty" tests really measure honesty? I suggest that the tests are more seriously flawed than he realizes, for two reasons:

1. Cheating is trivial. I've enclosed an article from the Autumn 1991 issue of *2600*, which explains how to beat the test. Such tutorials are widely available.

2. Honesty testing insults employees and creates an atmosphere of distrust that, together with low pay and lack of autonomy, fosters dissatisfaction. My experience lies in data security rather than retail sales, but the central principle remains the same: employee satisfaction is the determining factor in fraud and theft. No screening system, no alarms will do a bit of good if your employees don't like you.

As an aside, have you noticed a class distinction in the tests administered? Polygraphs have become necessary for many upper-class jobs, with honesty tests reserved for working class or "new collar" jobs.

Keep up the good work.

Michael Stern
New York, N.Y.

Scott O. Lilienfeld responds:

David Arnold's letter is riddled with misstatements and misrepresentations. Arnold appeals to authority rather than data, selectively referring to summary opinions of authors favorable to honesty testing but failing to cite any research refuting my criticisms (e.g., excessive false-positive rate, fakability, positive correlations with lie scales, potential systematic error). Before addressing his criticisms, I believe that readers are entitled to know that Reid Psychological Systems, of which Arnold is General Counsel, is one of the primary marketers of honesty tests and was for years one of the principal developers and distributors of polygraph tests in the United States. These facts may help to place Arnold's remarks in context.

1. Arnold's assertion that "reputable [honesty] test publishers have welcomed and supported" research by outside investigators is disingenuous at best. As one example, one of my academic colleagues recently attempted to obtain permission from a large number of honesty testing firms to conduct a study on the trainability of honesty tests. He was turned down by every publisher, and in one case was berated over the telephone by the head of a major honesty testing firm for attempting to perform research that might call the validity of honesty tests into question! Similarly, a graduate student and I were refused permission by 6 of 10 honesty testing publishers, including Reid Psychological Systems, for a study of the association between honesty tests and moral reasoning. I should point out that these refusals occurred after the publication of the "Model Guidelines" to which Arnold refers. Honesty testing researchers we have spoken with have encountered similar difficulties.

Moreover, Arnold's contention that "specific knowledge regarding a test's key is not imperative to conducting validation research" is mistaken. To the contrary, knowledge of a test's key is absolutely necessary for performing research on a test's structural validity. Structural validity concerns the extent to which the internal structure of a test is consistent with theoretical predictions, and includes evidence concerning a test's factor structure. Such evidence is an essential component of test validation, and cannot be conducted without information at the item level.

2. Arnold overlooks the potential moral implications of honesty testing. Surely screening potential employees on the basis of a variety of characteristics that have been found to be associated with theft-proneness (e.g., low socioeconomic status, presence of

learning disabilities, family history of criminality) would result in a decreased number of classification errors. Nevertheless, such screening methods would never be tolerated because of their problematic ethical consequences. A reduction in "classification errors" is simply not sufficient to justify use of a psychological test (witness the downfall of the polygraph); but this is the only justification Arnold offers.

3. Arnold's nearly exclusive emphasis upon classification errors misses the point in another way. In my article, I acknowledged that honesty tests, like the polygraph, appear to possess above-zero validity for some criteria (e.g., workplace theft). My central criticism, which Arnold does not address, is that the classification errors made by honesty tests may not be unsystematic or random (like the misses of a dart thrower around a target), but rather systematic and biased against certain groups (e.g., highly religious individuals, individuals who are especially candid in their responses). The honesty testing industry's failure to conduct adequate studies to examine this possibility can only be regarded as self-serving.

Regrettably, Arnold's letter only reinforces the widespread perception of the honesty-testing industry as inimical to outside criticism and scientific scrutiny.

Science and feminism

From the opening paragraphs, I was very disappointed in the article "Science: The Feminists' Scapegoat?" by Barbara Walker (*SI*, Fall 1993) and in your magazine for printing it. Perhaps it is just the skeptic in me that bristles whenever someone overuses the inclusive "we." But as I continued to read, I became increasingly disturbed. Who are these feminists that "are in danger of going too far . . . when we label patriarchal and bad everything that is modern/scientific, while declaring matriarchal (or natural) and good everything that is primitive/magical?" Who is it that engages in the "indiscriminate trashing of all scientific disciplines"? Gloria Steinem? Robin Morgan? Patricia Ireland? I don't think so, and there are no quotations and no references cited that might lend a clue.

I'm puzzled that Barbara Walker has authored 19 books, at least three of which have feminist-sounding titles, and yet does not accurately describe any "we" that I, an active feminist, belong to. Of course every large group, especially as diffuse a group as "feminists," has a fringe element, so I am sure there are some feminists who trash science. But it sounds as if Walker doesn't attend meetings sponsored by the National Organization for Women, the National Abortion Rights Action League, the Coalition of Labor Union Women, the League of Women Voters, or any other groups where mainstream feminist activists are likely to gather.

Probably the most talked about feminist book this year was *Backlash: The Undeclared War Against American Women* by Susan Faludi. Barbara Walker's article seems to be perfect "backlash" material. First, the article reinforces the antifeminist notion that women (feminists?) are uncomfortable with science, technology, and the discipline of objective reasoning. Second, it suggests that feminism has failed women by implying that women do not need to be scientifically aware. Third, it detracts readers from real feminist issues, such as violence against women, pay inequity, the anti-choice movement, and child care, just to name a few. Fourth, this article would comfort those who would like to believe that female scientists are not representative of the majority of women (feminists?) who are presented as intuitive, emotional thinkers. Finally, it might cause female skeptics who are not in the feminist network to feel unnecessarily isolated.

Toni Tumonis
Silver Spring, Md.

I am writing to praise Barbara G. Walker's excellent article, "Science: The Feminists' Scapegoat?"

I have frequently encountered the ostensibly feminist view that science is inherently male and rapacious to the environment, society in general, and

women in particular. Most recently, this issue arose in a conversation with a friend of mine who has B.S. and M.S. degrees in biology from Stanford University.

While I agreed with her that science has often been used as an oppressive and destructive tool against women and other disenfranchised groups, I couldn't agree that science as a whole is morally bankrupt. I view science as a tool, like a hammer; one can use it in productive ways (e.g., to build a house) or destructive ways (e.g., to split someone's skull); but the problem lies in its application, not the tool itself, as Walker lucidly argued.

What is needed is greater public debate about which applications of science are of greater and lesser public value, not a wholesale condemnation of science. No amount of "intuition" or "wishful thinking" will bring a cure to the AIDS virus or any other pressing problem. (Not to totally discount intuition, either; intuition can lead to interesting hypotheses to be tested scientifically, even though it is an ineffectual means to verify those hypotheses.)

After being subjected to what sometimes seems like a tide of antiscientific sentiment, I appreciate Walker's well-reasoned and sane defense of science.

Dennis E. Lee
Los Angeles, Calif.

I agree with Barbara Walker that "to exclude personal attitudes of the investigator no matter what they are and to concentrate on the subject matter alone" is a right and admirable goal within science. However, acknowledging that humans do science within a social context despite this intention may be the real objectivity. We know too much now, in great part due to feminist scholarship, to refer to scientific objectivity as self-evident truth as Walker seems to in her article.

Most important, feminist scholars are *not* just questioning the misapplications of science but the very notion of unquestioned objectivity—recognizing that what we select to study, what we end up seeing, and how we interpret what we see—involves not just scientific method but also how we have been socialized.

For how many years (and repeated experiments) was it "hard knowledge" that women and people of color were scientifically and objectively measured to have smaller brains and thus concluded to be inferior to white European males? No doubt scientific objectivity has been, at times, a mask for racism and sexism. I am not a relativist, but I believe Walker misleads by implying that subjective and objective states are polar opposites in the real world. Feminist scholars, Stephen Jay Gould, and others have shown otherwise. I believe Walker errs in not mentioning their insights.

Rhonda Roland Shearer
New York, N.Y.

Barbara G. Walker responds:

Toni Tumonis seems to have misread my reference to the patriarchal view of women's alleged illogic, "a major prop for the myth of female intellectual inferiority," as an endorsement of that view. On the contrary, the central message of my article was that women should not tolerate such putdowns of their mental capacities.

I commend Tumonis's political activism, but I think she knows little about the spiritual side of the feminist movement. She seems unaware of the numerous women's groups now drawing away from patriarchal organized religion to explore less misogynous alternatives. Unfortunately, it's not uncommon for such groups, in the name of open-mindedness, to become too open to some forms of New Age nonsense.

My article made the point that women should not be seduced into embracing new varieties of irrationality by the old contention that they are all basically irrational anyway, because this contention is absurd. See my books Women's Rituals, The Skeptical Feminist, *and* The Woman's Encyclopedia of Myths and Secrets *(with plenty of*

references) about the rapidly burgeoning field of feminist spirituality.

Rhonda Shearer's point is certainly well taken, but she may be confusing the social sciences with "hard" science. There is a difference between the discovery of facts outside the human context, as in chemistry or physics, and the recognition of investigator bias in such disciplines as anthropology, sociology, history, and psychology. As the current reassessments of Freudian theory demonstrate, we should never take too literally the conclusions of those who claim scientific objectivity without really comprehending it.

'Perspectives on Education'

As a retired educator, I was very pleased to read "Perspectives on Education" (*SI*, Fall 1993).

From the inside, it has always appeared to me that we were doing a good job. I was sure the apparent downward trend was due to more and more students' being included in the process, many who a few years ago would have been labeled "uneducable."

We do have an educational problem in the U.S., but it is not the system; it is the attitude of much of the public. Many, far too many, do not value education. There are several reasons for this, not the least of which are demagogic persons who simply do not want to spend money on others. Many on the Religious Right for several reasons attack public education and educators. Making fun of the "smart" and those who do well is a ubiquitous source of "humor." Scholarly work "gets no respect." The few bad apples get all the attention. Somehow we must restore education as a "value."

P. M. deLaubenfels
Corvallis, Ore.

In seven years of teaching introductory courses at universities and community colleges I've been astonished at the poor basic skills and almost willful ignorance of the world around them that high-school graduates bring into the college classroom. Imagine my surprise to find Kendrick Frazier's article in the Fall 1993 *SI* defending the Sandia study, which flies in the face of such direct experience ("Our comparison of technical workforces reflected well on the U.S. education system").

The problems I see with the study described in this article can be divided into three categories:

1. *Straw-man argumentation.* American education may not be cost effective, but I don't know anyone who's running around claiming "American schools are the worst in the world." I have it on good authority that the combined effects of the earthquake and the war with Azerbaijan have left the Armenian school system in shambles. We doubtless also look pretty darned good compared to Chad and Bolivia!

2. *The Sandia study failed to measure anything meaningful.* SAT scores supposedly measure aptitude rather than preparation, and thus are an intrinsically poor measure of school performance. The irony here is that most of the people misinterpreting these scores graduated from American schools.

A high school diploma is meaningless as an indicator of what a student can actually do. The fact that the present rate of completion of four-year degrees is comparable to high school graduation rates in the 1930s merely confirms my suspicion that the modern bachelor's degree is roughly equivalent to the high-school diploma of my parent's generation.

A recent survey by the Education Testing Service, which attempted to measure skills (rather than "aptitude"), found that almost half of adult Americans can't handle basic English and math. Any bets on how many of those folks are high-school graduates?

3. *The "primary challenges" identified in the report are useless fluff.* At what point in history has "adjusting to demographic changes and immigration" not presented a challenge to American education?

G. Kent Colbath
Brea, Calif.

Kendrick Frazier responds:

For further behind-the-scene details of the suppression, peer review, and eventual publication of the Sandia report, and for a view of its significance contrary to that expressed by G. Kent Colbath in his letter, see the nine-page article "A Nation 'Truly' at Risk," by Daniel Tanner (Rutgers University), in the December 1993 Phi Delta Kappan, *the professional education organization. Readers may also be interested in Peter Huber's column "The Lie of Averages," stimulated by our article, in the December 20, 1993,* Forbes.

The 'blind girl' story

As a lay person, I would like to know the difference between a lie and a myth. Rolf Sinclair, in his article "The Blind Girl Who Saw the Flash of the First Nuclear Weapon Test" (*SI*, Fall 1993), refers to the perpetuation of this story as a myth. It seems to me that in order for the story to have been reported at all somebody lied to make the event of the nuclear bomb test more significant.

I am not so concerned with the people who perpetuated the myth as I am with the individual who lied. Most people trust the media, expecting all the little details in a report to be factual. What can the public do otherwise? A lie that gets carried on the wind and takes on mythical proportions is simply due to the public's lack of resources, time, and knowledge to check out the story's validity. We trust our free press to do that.

I am an average Joe Public who picks up my local paper every day wondering what facts have been omitted to suit the reporter's agenda. At the same time I am at a loss about what to do about it. I do not like being lied to.

A. R. Kelly
Stockton, Calif.

Sinclair's "The Blind Girl . . ." article is infuriatingly imprecise to an ophthalmologist.

To the layman, "blind" means no sight, nothing, complete blackness. Thankfully this is a relatively rare condition. Medically, however, "blindness" starts at the "little E" (Snellen 20/200) and runs the gamut through the "big E" (Snellen 20/400), count-fingers vision (from one to ten feet), hand-motion vision (at one to twelve inches from the face), to light perception (from four different quadrants), finally to "total" blindness or ophthalmologically "no light perception."

The history of this girl was that she "had vision" (what kind was never explained) in only one eye since birth. What level of blindness was present in the other eye? Then, at age seven, she damaged her "good" eye on a refrigerator and "*essentially* lost its use" (italics added).

"Essentially" used in this context could mean anything in the gamut of blindness, but does imply at least light perception—the last thing to go before total blackness, or the lay concept of blind. Hence it would be *expected* that this girl could see light with one eye, or perhaps both.

Sinclair cannot be faulted for not having access to medical records. However, a clear understanding of what the definition of blindness is, is a prerequisite to judging the merits of newspaper reporting.

Christopher Lyon, M.D.
Board Certified Ophthalmologist
Newport Beach, Calif.

Rolf M. Sinclair responds:

Christopher Lyon is of course correct. Medically, "blindness" is not a specific term and must be qualified in each case. I used "blind" in the popular sense (like "Blind Pew" in Treasure Island*). This is the sense in which it was used in my references, and the sense in which the public understoood it. My point was that Georgia Green could detect light to some extent, which took away the basis of the myth that sprang up.*

I appreciate A. R. Kelly's concern—but no one "lied" consciously. I think it was that people simply took the easy path. The

first report referred to Georgia Green as "blind" without qualification, although she did have limited vision. Then successive writers and the public assumed that "blind" meant a total lack of vision. The story grew from this simplification. If at some point a writer had been interested in the actual degree of vision she had, and had introduced the proper medical terms, the whole story might have come into focus. But I suspect that all concerned found the story of the "blind girl" to be interesting and newsworthy in its own right and didn't think to raise these questions.

Indians, New Agers, and racism

Being from Mexico, I sympathize with Rick Romancito's frustration with misconceptions about "Indian spiritualism," since, as he points out (Forum, Fall 1993), there isn't just one Indian religion. I feel the same way when the terms Mexican, Mexican-American, Hispanic, Latin American, etc., are used interchangeably. However, Romancito's concern about the loss of identity of Indian peoples when their spiritual practices are "stolen" by outsiders seems to me misguided. It is clear that spiritual practices, as any socially defined behavior, acquire meaning within a system of beliefs. Surely, when an alien cultural behavior is adopted, part of its original meaning is lost. But perhaps because, as human beings, we share enough common background, cultures are not hopelessly isolated from one another.

The important point is that with global communications, the present identity of every culture is threatened by outside influences and usurpations, but I find it perverse to try to keep them intact. Cultural diversity is enriching only in so far as cultures mix, presenting us with choices.

I believe the only way out of the catch-22 of racism is cultural and genetic assimilation. Strangely, this view is seen as racist by some, on the grounds that it leads to the dilution of "minority" cultures into the Western culture. Yet, ethnic isolationism appears to me dangerously close to Apartheid, especially if cultural fusion is to be forestalled on the basis of race.

It is worth noticing that multiculturalism, in the sense of preserving, and even fostering, the separate existence of a multitude of cultures, is a product of the postmodern view of the world. With its emphasis on subjective and spiritual experiences, its rejection of the concept of historical truth, and its equal regard for all cultural behaviors regardless of their instrumental success, postmodernism often comes too close to a pseudoscientific creed. This is not surprising since postmodernism is, after all, an attack on rationalism. In my view, multiculturalism is one of the few concepts worth rescuing from the postmodern mess, but we have to handle it with care. It is important to avoid both cultural relativism and racism.

I find racism to be one of the most difficult topics in the United States, perhaps because it is plagued with misconceptions. One common mistake, seemingly made by Romancito, is thinking that all stereotypes are racist. In fact, the difference between a stereotype and the meaning of a word is very thin. We all think in partial truths; rarely do we possess all the relevant information. Thus concepts are almost always stereotypes. Their usefulness depends, obviously, on their accuracy; they become prejudices only when they are taken to be the whole unshakeable truth.

In so far as many Indian tribes do have unique religious beliefs, the idea that they possess special spiritual knowledge does not seem demeaning. Furthermore, since this idea is based on a cultural rather than a racial trait, it is not racist (but then, of course, the important difference between "racial group" and "cultural group" is very often blurred).

Also, there is no moral obligation to try to solve the problems of a community before you are allowed to be culturally influenced by it. If Picasso had worried about the low educational standards, the health problems, and the issue of constitutional rights in Africa, he would never have painted "Les Demoiselles D'Avignon."

Large mammal discoveries

Kendrick Frazier (*SI*, Fall 1993, p. 12) writes: "The discovery of a new species of mammal [a Vietnamese antelope of the family Bovidae] . . . is . . . a sobering lesson for all who might have thought such a thing impossible." I suspect that the people Frazier has in mind are those proverbial hidebound establishment scientists—because that is the only group I have ever seen accused of being in need of such a "sobering lesson." The accusers have always been the fringe-scientists known as "cryptozoologists." These people consistently misrepresent informed scientists' justified and specific skepticism concerning the Loch Ness monster, Bigfoot, living African dinosaurs, etc., as a misguided general skepticism of there still being undiscovered creatures of *any* sort. The cryptozoologists can then portray themselves as the only ones who know better, so that every time some previously unknown animal turns up, they can trumpet it as a vindication of their position.

The new animals that *do* turn up, of course, are always creatures completely undreamt of by the cryptozoologists, and are always discovered and made known to the world by the supposedly hidebound establishment scientists—never by the cryptozoologists. As we informed hidebound establishment scientists well know, we are now naming about 16 or so new species of mammals every year, and there's no end in sight. Of course most of our newly discovered species are small mammals, because most kinds of mammals are small. I myself have discovered and named three new species of opossums, a new species of bat, two new species of "field mice," and have "co-named" one new species of porcupine. I have also encountered three additional kinds of mammals in the field that were later named as new species by my fellow hidebound establishment scientists.

Frazier continues, "It has been more than 50 years since any comparable find of a large mammal species was made." Frazier doesn't tell us what he means by "comparable," but it should be noted that the following 13 species of good-sized to very large mammals were discovered as living animals in the past 50 years: two porpoises—*Lagenodelphis hosei* (1956) and *Phocoena sinus* (1958); three beaked whales—*Mesoplodon ginkgodens* (1958), *Mesoplodon carlhubbsi* (1963), *Mesoplodon peruvianus* (1991); a wild pig—*Sus heureni* (1987); a peccary—*Catagonus wagneri* (named from old bones in 1930 but reported as a living animal in 1975); four deer—*Mazama chunyi* (1959), *Moschus fuscus* (1981), *Muntiacus atherodes* (1982), *Muntiacus gongshanensis* (1990); a gazelle—*Gazella bilkis* (1985); and a wild sheep—*Pseudois schaeferi* (1963). One of these recently described animals (the first-named porpoise) was placed in a new genus, and the peccary is in a genus that was thought to be extinct. The last eight of the species listed are in the same order (Artiodactyla) as the newly described Vietnamese antelope; the gazelle is likewise an antelope, and it, along with the wild sheep, are in the same family Bovidae as the Vietnamese animal. One of the porpoises, and especially the whales, of course, are much larger than the new Vietnamese bovid and weigh much more than it does.

The animal referred to incorrectly by Frazier as the "kouprey *bos*" is properly known either as the kouprey (English "common" name) or *Bos sauveli* (scientific name). Frazier states it is the last species of large mammal discovered. The much larger beaked whale, *Tasmacetus* (new

genus) *shepherdi*, was named the same year (1937) as the kouprey, however.

It is a measure of how insidious fringe-scientific misrepresentations are that even such an ur-skeptic as Frazier can apparently be taken in by one of them. I am reminded of various pseudoscientific claims that have been made by creationists and that have come to be widely accepted by otherwise well-informed people who are totally unaware of the origins of these supposed facts. Frazier, of course, is by no means the only journalist to be misled by the cryptozoologists' representations of things. *Newsweek* for October 26, 1992, went ape—as did the press generally—over the unremarkable discovery of a new kind of small monkey and stated outright that this sort of event gives support to the contentions of cryptozoologists. Somewhat less extreme misconceptions and misinformation were responsible for the errors made by journalists in the magazine *Nature* for June 3, 1993, and even by the scientists who reported the Vietnamese animal in that issue—and that's where Frazier got his understanding of this matter.

Ronald H. Pine
Illinois Mathematics
and Science Academy
Aurora, Ill.
and Field Museum
Chicago, Ill.

Kendrick Frazier tells us the good news of the recent reporting of *Pseudoryx* from Indochina, and suggests that this is the first new species of large mammal to be recorded since 1937, when the kouprey was announced.

The accuracy of this claim depends on what we mean by "large." At any rate, it might be worth noting that in 1976 science acknowledged the existence of *Catagonus wagneri*, a new genus of peccary from South America, weighing in at nearly 40 kilograms (around 100 lbs.). Like *Pseudoryx*, its appearance was presaged by many reports of "the third peccary" by local hunters, and a substantial number of bones and teeth from kitchen middens. The curious thing is that this wild pig-relative had managed to avoid notice by Western science for so long despite living in open grassland and thornscrub habitats—quite different from the tropical forests where *Pseudoryx* lives.

Paul Handford
Zoology Department
University of Western
Ontario
London, Ont., Canada

Kendrick Frazier responds:

I thank Ronald Pine, and Paul Handford too, for the interesting information about mammal species discovered in the last half-century, which I'm glad to share with our readers. The new Vietnamese bovid, the discoverers say, is a new genus as well as species. The phrase "more than 50 years since any comparable find of a large mammal species" and the term "kouprey bos*" are taken directly from the* Nature *paper (363:443), so presumably Pine's complaint is directed to its authors. I did not mention cryptozoologists.*

Dung et al., *Nature*, 363:443 (1993).

Cranium of the new Vu Quang bovid.

I applaud CSICOP's stated efforts to diversify its rational reach beyond just the paranormal, but in investigating other claims it is important to keep the rigorous analysis for which the SKEPTICAL INQUIRER is known. As I hinted above, racism is rooted in a failure to exercise skepticism of our beliefs about other people. Therefore, racism lies squarely within CSICOP's new range. It was not necessary to refer to New Age ideas to introduce the subject.

Alvaro Caso
Dallas, Texas

Alvaro Caso is a cultural attaché, Consul of Mexico, in Dallas.

Science, Aztecs, and ethics

In his review of Anthony Aveni's, *Conversing with the Planets* (*SI*, Fall 1993), L. Stephen Coles has slipped into the kind of argument that scientists decry when others criticize the ends to which science and technology are put. Science and the scientific method should not be blamed if the resulting technology is used in ways that are inappropriate or reprehensible. It is equally inappropriate for Coles to state: ". . . if they [the Maya] were so knowledgeable and 'civilized,' judging by their mathematical calendar-making skills, how come they indulged in ritual human sacrifice. . . ? Today, we would consider such a practice barbaric and highly *uncivilized.*" Would a Mayan be justified in judging our level of scientific development by Auschwitz or Hiroshima?

The glory of the scientific method is that in the past several hundred years there has been measurable progress, so that one can speak of "primitive" technology and "advanced" technology. This cannot be said of such things as languages or religions. Non-Western and even preliterate societies can have extremely complex and sophisticated religions and languages, and high ethical standards. The participants in Watergate, Iran-Contra, and the S&L affairs, if judged by Aztec standards, would all be serving long sentences or even have been executed. In that society, the ethical standard to which people were held, and the degree of punishment, increased with their status and the level of public office that they occupied.

Bernard Ortiz de Montellano
Pleasant Ridge, Mich.

Science and truth

One does not very often encounter more confused thinking than that displayed in "Science and Truth and Us" (Forum, Fall 1993) by Ralph Estling. The author seems to take exception to scientists' preference for facts over truth. . . . It seems to me that the author's principal objection is to physicist John Archibald Wheeler's statement, "No phenomenon is a real phenomenon unless it is an observed phenomenon." The statement embodies the long-standing dispute between classical and quantum physics. It poses no logical problem in the context of classical physics. Would Estling advocate that scientists accept as facts phenomena that have never been observed but only conjectured? Wheeler's statement, made in the context of quantum physics, however, does make some people uncomfortable because of its implication that observation affects reality by altering the phenomenon being observed. This does not in any way clash with scientists' preference for facts; it only states that facts, as observed, are results of modification by the act of observation. No conflict with objectivity is inherent in this proposition. . . .

Estling's chief difficulty is in understanding that truth is subjective because it requires a human mind together with its attendant presumptions to be conceived, while facts are manifestations of the immutable laws of nature at work. Championing truth over facts is not a scientific or objective procedure. Truth is always biased and therefore disputable. Facts cannot be disputed. . . .

Anutosh Moitra
Yorktown, Va.

How ungrateful of Ralph Estling to see the universe as unconcerned with him. This is a universe concerned enough to devote 15 billion years to painstakingly creating him, today expressing its concern for his feelings and beliefs through the empathy of other humans. His conclusion that the truth cares not a whit for people requires that he ignore the grandest truth of all, the evolution of minds that contemplate their universe, including themselves.

The author of the assertion that the truth shall make you free was somebody all right, the Jesus of the Fourth Gospel (John 8:32), referring to servitude to sin. It is odd that Estling finds no merit in this claim. Surely there is freedom in the release from superstition and dogma that has been offered by the revelations of science.

Al Clarke
Thousand Oaks, Calif.

Ralph Estling responds:

Confusion there certainly is. If Anutosh Moitra thinks I draw a distinction between facts and truth he is very confused indeed. And if he believes that truth is subjective, something created by us, then I can only say that the truth he has in mind is not the truth I have in mind.

The real distinction is between what we believe *to be facts (or truths) but which in fact and in truth are only our observations and subsequent interpretations. The central mystery of quantum mechanics is one result of this clash between external, objective reality states and our internal subjective observations of them, summarized in the "Strong Copenhagen Interpretation," of which John A. Wheeler is an advocate. The question is not merely a case of our observation affecting reality but, says Wheeler (and others), a matter of that observation effecting it, that is, bringing it into existence from a previous state of nonexistence. Has Moitra recently observed all his constituent subatomic particles and does he continually keep them all under constant observation? If he has not and does not, then, by his own contention, he cannot be said to exist, and so neither do his arguments. Q.E.D.*

Not only is the universe unconcerned with me, what is far worse, it is also unconcerned with Al Clarke. The sad truth is (for "truth" see above) that the universe did not *create itself with either Clarke or me in mind either at its outset or later on—after it settled down into galaxies and things and could have a think. I am very much afraid the universe does not think at all.*

I am aware that the person who informed us that "the truth shall make us free" was Jesus. Unfortunately, the "truth" he was referring to is not the truth I am referring to (again see above). The "truth" Jesus had in mind was not scientific truth but merely new forms and interpretations of that "superstition and dogma" from which Clarke says he seeks release.

Why are so few skeptical?

You ask why so few women are skeptics. Better ask why so few *people* are skeptical.

Our entire socialization process and education are designed to foster respect for and acceptance of authority—if the population at large learned critical thinking, then there might be widespread rejection of standard political and religious ideas. Thus even scientific education concentrates on learning facts and not on the scientific method, so that many who are successful in the technical and scientific fields never examine their inherited dogmas. (Or, what is worse, find "scientific" justifications of religious principles or ethnic and sexual superiority.)

Formal skepticism is found among women even less frequently than among men, for several reasons. The first is, of course, that fewer women receive technical education. (This starts in childhood—one learns more about cause and effect by building and dismantling objects than by assisting with cooking or childcare.) As to the studies claiming women have less innate mathematical and analytical ability (but which really show just different statistical distributions of abilities; so I guess I won't have

to give back my A in calculus), I consider these studies methodologically flawed and unable to erase the effects of cultural conditioning. (You'll need to show me a good PET-scan study demonstrating differential brain activation in untrained subjects.)

More important is the all pervasive cultural conditioning that urges women not to rock the boat; not to question authority (civil, religious, masculine); to act emotionally and intuitively. The social message is clear—flaky hyper-emotional behavior is desirable, calm rationality is not. Remember even Lucy (the apotheosis of ditziness) got Ricky Ricardo, and he was a nice-looking guy with a good job. And the Vulcans, those pinnacles of logic and rationality, clearly prefer emotional Earthwomen to their own females.

As to how to attract more women to your readership—Gee, I dunno. I've kind of been hoping for skeptical singles ads.

Sharon N. Farber, M.D.
Chattanooga, Tenn.

Keep SI's unique status

The *SI* letters column sometimes features advice from readers who wish that CSICOP would broaden the scope of its activities to include the debunking of religion. I believe that this would be a mistake. The task of showing that religion is irrational and intellectually indefensible has already been accomplished. Hume's critique, extended and sharpened by his successors, makes it clear that the "proofs" of God's existence are fatally flawed. The effect of rehashing these arguments in *SI* would be to turn it into just another philosophy journal and would compromise its unique status as a forum for the examination of claims that can be evaluated and refuted by observation and experiment.

Reports of weeping or bleeding statues, poltergeists, or supernaturally bent spoons do fall within CSICOP's domain and invite comparison with yarns from the Bible about miraculous healings and resurrections. When the former are exposed as instances of gullibility or fraud, belief in the latter becomes more difficult.

Some scientists give lip service to religion in their public pronouncements, probably in the hope of avoiding the stigma that society attaches to avowed atheism. Often this is done through semantic sleight of hand: the "God" in whom belief is professed is defined in some idiosyncratic way that bears no relation to the traditional meaning of the word. Even Einstein played that game. Such obfuscation calls for rebuttal, though not necessarily in the *SI*. But when it is claimed that specific evidence for religion is to be found in the facts of science, a reaction from CSICOP is entirely appropriate.

David A. Shotwell
Alpine, Texas

Asimov urban myth?

In the Fall 1993 *SI* (Letters), Joseph Aspler suggests that a new urban myth is making the rounds that states that the late Isaac Asimov had been reluctant to admit his disbelief in religion. This "myth" is based on fact.

In the second volume of his autobiography, *In Joy Still Felt*, Asimov describes his appearance on the David Frost show that was taped August 15, 1969. Frost began the interview by asking Asimov point blank if he believed in God. Asimov recalls: "That rather took my breath away. It was a dreadful way of putting a person on the spot. To answer honestly, 'No,' with millions of people watching could arouse a great deal of controversy I didn't feel much need of." Asimov eventually brushed off the question with a wisecrack.

Doubleday chose to print this passage on the rear dust jacket of *In Joy Still Felt*. No doubt it has been read by many people who picked up the book but did not take the time to read the book thoroughly. Not included on the dust jacket is the fact that Asimov's father

had died a few days before, perhaps contributing to his reluctance to stir up a public controversy. Of course anyone who has read the complete autobiography would be familiar with Asimov's views on religion.

William E. Vanderlinde
Ellicott City, Md.

Did the spoof come first?

Readers of *SI* who enjoyed Robert Baker's review of Lyall Watson's *The Nature of Things: The Secret Life of Inanimate Objects* (Fall 1993) may be interested to know of a book review that appeared in *New Scientist* in 1985 (19/26 December, p. 71). The book was *Automagic: The Secret Life of Machines* by Ned Ludd. The reviewer summarized the provocative ideas put forward in the book:

> Something for all those . . . who ever had cause to curse a recalcitrant lawn mower. . . . And for those . . . who cope easily with the technological revolution, but nevertheless harbour a sneaking suspicion that their computers are involved in unprogrammed speculations on their own account, perhaps even in collusion with others of their kind. . . . This is a lucid and authoritative treatment of the whole vexing question of artificial intelligence, which plots every step of our displacement by a more dominant life form. . . . No one reading the final chapters can be left in any doubt about . . . the ability of souls in new machines to survive built-in obsolescence.

At the end of the review, he concluded:

> I heartily endorse Martin Gardner's enthusiastic review in the SKEPTICAL INQUIRER, where he describes Automagic as "absolutely metal-bending."

Those who have read the UK edition of Watson's *The Nature of Things* will recall seeing the following blurb on the cover.

> We all have experiences of the natural perversity of inanimate objects—those strange moments when things seem to take on a life of their own. . . . Are we assisting in the unfurling of a new form of life? Are inorganic things that have surrounded us from the stone age to the computer age really coming to life? Have we invested them with that life through our attention to them? And are we . . . about to surrender our dominion to machines?

Note the strange similarity of this summary to the passage in the review of Ludd's *Automagic*. Also, one of the subheadings in Chapter 6 of Watson's book is "Automagic." What happened was that *New Scientist* had invited Watson (and some of its other favorite "science writers") to concoct spoof reviews of imaginary books that they would like to read (and there is no point in looking for Gardner's *Automagic* review in *SI*). Another mystery solved. However, *SI* readers might like to know which came first, the spoof or the idea for *The Nature of Things?*

David J. Fischer
Cardiff, U.K.

Anecdotes on TV talkshows

"Exploring the Television Wasteland," by Paul Kurtz (*SI*, Summer 1993), describes a common problem among people who use anecdotes as evidence of phenomena. Media events, such as the "Shirley" show offer troubled people and others support for their unhealthy behaviors and perhaps foster the notion that we are not necessarily in control of ourselves and therefore not completely accountable for our behavior. Hence the plea of "insanity" by accused murderers could be modified to a plea of "I subscribe to the power of my dreams, a force beyond reproach."

Lewis Wolpert's book, *The Unnatural Nature of Science* argues (p. 136): "Doing a proper experiment on paranormal phenomena makes the subjects self-aware and so eliminates the phenomena. . . . It is thus very difficult to assess the reality of such phenomena." Wolpert

explains that it is not easy to challenge paranormal claims because proper evaluation methods are not subscribed to by paranormal proponents who prefer to get their knowledge "on the cheap" and not through the painstaking ways of true scientists.

H. L. Mencken expressed the opinion that nobody ever went broke underestimating the intelligence of the public. Wolpert says, "The capacity of self-delusion, even among scientists, should never be underestimated: conviction can have profound effects on observation!"

Exploiters like Shirley Solomon are more dangerous to society than the quacks selling cancer cures. There are no appropriate bounds or limits placed on her behavior.

John Philion
Brentwood Bay
British Columbia, Canada

CSICOP and the Royal Society

The Royal Society was founded in 1660 and supported by King Charles II. Continuously in existence since that time, Great Britain's Royal Society is one of the oldest scientific associations in history. There are some interesting parallels between R.S. activities and those of CSICOP. The latter "encourages the critical investigation of paranormal and fringe-science claims from a responsible scientific point of view and disseminates factual information about the results of such inquiries to the scientific community and the public." Contrast this with Royal Society activities (quoted from H. Lyons's *The Royal Society: 1660-1940* [Cambridge University Press, 1944]).

> Many local superstitions were also brought before them, and these were seriously considered and tested in order to either establish their validity or to refute them. One of the most valuable tasks which the Society set before itself from its earliest days was that of testing any legends or ill-supported statements, which were reported to it, by a critical verification of the facts. This procedure did much to discredit the belief in witchcraft, demoniac possession and supernatural intervention in human affairs which was even then beginning to lose its influence over the minds of many in the educated classes. (p. 29)
>
> . . . There were also many rumors, reports and strange occurrences which came before them for explanation or enquiry; among these were the supposed virtues of May-dew collected before sunrise; Dr. Dee's skill in weather forecasting reported by Sir K. Digby; the petrification of wood in Ireland; the production of young vipers from the powdered livers and lungs of vipers; a poison which turned a man's blood into jelly; the composition of a "sympathetic" powder which would cure a wounded man if the weapon or his blood were treated with it; divining by means of hazel rods; whether a spider set within a circle of powdered unicorn's horn could cross it: that it could not do so was refuted by an experiment; the tale of a city in northern Africa where all the inhabitants had been petrified was vouched for by a friend of Sir K. Digby. (p. 30)

Clearly, CSICOP enjoys some distinguished historical antecedents. It is also clear that the more things change the more they stay the same, judging by the phenomena investigated by the two groups.

Bruce A. Thyer
School of Social Work
University of Georgia
Athens, Ga.

The letters column is a forum for views on matters raised in previous issues. Brief letters (less than 250 words) are welcome. We reserve the right to edit longer ones. They should be typed double-spaced. Due to the volume of letters, not all can be published. Address them to Letters to the Editor, SKEPTICAL INQUIRER, 3025 Palo Alto Dr. NE, Albuquerque, NM 87111.

Guide for Authors

The SKEPTICAL INQUIRER critically examines claims of paranormal, fringe-science, and pseudoscientific phenomena from a responsible, scientific point of view and provides a forum for informed discussion of all relevant issues. It encourages science and scientific inquiry, critical thinking, and the use of reason and the methods of science in examining important issues. The readership includes scholars and researchers in many fields and lay readers of diverse backgrounds. Write clearly, interestingly, and simply. Avoid unnecessary technical terms. Maintain a factual, professional, and restrained tone. All submissions are judged on the basis of interest, clarity, significance, relevance, authority, and topicality.

Direct critiques toward ideas and issues, not individuals. Authors should be prepared to provide documentation of all factual assertions. A useful set of guidelines for those who seek to evaluate paranormal claims, titled "Proper Criticism" and written by Professor Ray Hyman, is available from the Editor. Among the guidelines: clarify your objectives, let the facts speak for themselves, be precise and careful with language, and avoid loaded words and sensationalism. State others' positions in a fair, objective, and nonemotional manner.

Categories of Papers

Categories of contributions include Articles, Book Reviews, News and Comment, Forum, Follow-Up, and Letters to the Editor.

Articles: Articles may be evaluative, investigative, or explanatory. They may examine specific claims or broader questions. Well-focused discussions on scientific, educational, or social issues of wide common interest are welcome. We especially seek articles that bring fresh perspective to familiar subjects. Articles that help people gain an understanding of unusual experiences that they might otherwise interpret as "paranormal" are useful. So are articles that portray the vigor and excitement of a particular scientific topic and help readers distinguish between scientific and pseudoscientific approaches to answering key outstanding questions relating to it. Well-balanced articles that report on and evaluate controversial scientific claims *within* science itself are also needed.

Space is at a premium; there are always many accepted articles awaiting publication, and many submitted articles cannot be published. Be succinct. Articles are typically 2,000 to 3,500 words (about 8 to 12 double-spaced typewritten pages, depending upon font size). We cannot publish treatises. Articles should be organized around one central point or theme. If something is important it can be said briefly. Remember, Watson and Crick's paper reporting the discovery of the structure of DNA took just over one page in *Nature*.

The SKEPTICAL INQUIRER must be a source of authoritative, responsible scientific information and perspective. The Editor will usually send manuscripts dealing with technical or controversial matters to reviewers. The authors, however, are responsible for the accuracy of fact and perspective. It is good practice to have knowledgeable colleagues review drafts before submission. Reports of original research, especially highly technical experimental or statistical studies, are best submitted to a formal scientific journal; a nontechnical summary may be submitted to the SKEPTICAL INQUIRER. Studies based on small-scale tests or surveys of students will be considered only if they establish something new, provide a needed replication of some important earlier study, or test some new theoretical position.

Articles should begin with a succinct, inviting title followed by a concise, 10-to-20-word statement of the main point or theme. This will be set in display type on the first page of the published article. Include a brief cover letter stating that the article is submitted for publication and has not been submitted elsewhere and giving the authors' titles and affiliations and the lead author's address and home and office telephone and fax numbers. Include information in the letter or at the end of the

manuscript for an author note. If you do not wish your address given in the author note, please so state.

Book Reviews: Most book reviews are about 600 to 1,200 words. Both solicited and unsolicited reviews are used. Include publication data at the top of the review in this order: Title. Author. Publisher, city, year. Number of pages. Hardcover or paperback (or both), price. Include a suggested author note. If possible, include the dust jacket of the book for illustration.

News and Comment: News articles from 250 to 1,000 words are welcome. They should involve timely events and issues and be written in interpretative journalistic style. Use third person. The news sections of *Nature, Science, New Scientist,* and *Science News* are excellent models. Balance, fairness, and perspective are important. In reporting on controversies, seek and include comment and perspective from the various opposing parties.

Forum: The Forum column consists of brief, lively, well-written columns of comment and opinion generally no more than 1,000 words. Space allows only one or two per issue.

Follow-Up: The Follow-Up column is for response from persons whose work or claims have been the subject of previous articles. The original authors may respond in the same or a later issue.

Letters to the Editor: The Letters to the Editor section is for views on matters raised in previous issues. Letters should be no more than 250 words. Due to the volume of letters received, they cannot be acknowledged, and not all can be published. Those selected may be edited for space and clarity. Authors whose articles are criticized in the letters column may be given the opportunity to respond in the same issue.

Mechanical Requirements for Manuscripts

Text: Type all manuscripts *double-spaced,* including notes and references, on 8½" × 11" white opaque bond paper (not onionskin or erasable bond) with at least one-inch margins on all sides. If longer paper is used (e.g., A4), allow commensurately bigger top and bottom margins. Number all pages in sequence, including those for references, figures, and captions. For Articles, submit an original and two photocopies (for reviewers); for other categories, one original.

References and Notes: For reference citations in text, use author-date style: Smith (1994) or (Smith 1994). Arrange entries within References section alphabetically by the last name of author. Give full names of journals. Lower case article titles except for first word and proper names. Follow the style used in recent issues for other specifics. If explanatory notes are required, number them sequentially and include them in a Notes section preceding the References.

Figures and Illustrations: We welcome camera-ready illustrations with all submissions. Figures and graphs should be in high-quality camera-ready form. Photos reproduce better if they are black-and-white glossy prints. Assign each illustration a Figure number and supply captions on a separate sheet. Suggestions for obtaining other illustrations are welcome.

Proofs: Once a manuscript has been tentatively scheduled, it is phototypeset in house. We send proofs of Articles to authors. We may send proofs of other types of material at our discretion. The proofs should be returned corrected within 72 hours. At the time proofs are sent, authors will be asked to sign and return a copyright transfer form. Upon publication, authors are sent several complimentary copies of the issue, plus a form for ordering reprints.

The Editor's fax number is: 505-293-2757. The fax may be used for important messages and inquiries. It is generally not for submission of manuscripts, with the exception of short editorial items from abroad or other brief contributions known to be urgent.

All manuscripts should be sent first-class mail (air mail from abroad) to:

Kendrick Frazier, Editor
THE SKEPTICAL INQUIRER
3025 Palo Alto Dr. N.E.
Albuquerque, NM 87111 U.S.A.

Do not send manuscripts to CSICOP's headquarters in Buffalo. It is generally not necessary to send manuscripts by overnight express, but if you do so please initial the signature-requirement waiver.

Local, Regional, and National Skeptics Organizations

The organizations listed below have aims similar to those of CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these organizations cannot speak on behalf of CSICOP.

UNITED STATES

ALABAMA. Alabama Skeptics, Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-759-2624).

ARIZONA. Tucson Skeptical Society (TUSKS), James McGaha, Chairman, 5655 E. River Rd., Suite #101-127, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85082.

CALIFORNIA. Bay Area Skeptics, Wilma Russell, Secretary, 17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 94620 (510-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772).

COLORADO and WYOMING. Rocky Mountain Skeptics, Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

CONNECTICUT. (See New York Area Skeptics, New York.)

DISTRICT OF COLUMBIA, DELAWARE, MARYLAND, and VIRGINIA. National Capital Area Skeptics, c/o D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. Tampa Bay Skeptics, Gary Posner, 1113 Normandy Trace Rd., Tampa, FL 33602 (813-221-3533).

GEORGIA. Georgia Skeptics, Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. Midwest Committee for Rational Inquiry, Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomberg, Chairman, P.O. Box 20302, Springfield IL 62708 (217-787-9098).

INDIANA. Indiana Skeptics, Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM), Dick Schroth, Director, 425 Carriage Way, Baton Rouge, LA 70808-4828 (504-766-4747).

MASSACHUSETTS. Skeptical Inquirers of New England. Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. Great Lakes Skeptics, Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, MI 84230-1116.

MINNESOTA. Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416. **St. Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. Kansas City Committee for Skeptical Inquiry, Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

NEW JERSEY. (See New York Area Skeptics, New York.)

NEW MEXICO. New Mexicans for Science & Reason, John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. New York Area Skeptics (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massapequa, NY 11758, (516) 798-6902. **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. South Shore Skeptics, Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014, (513) 369-4872 or (606) 581-7315.

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TEXAS. Houston Association for Scientific Thinking (HAST), Darrell Kachilla, P.O. Box 541314, Houston, TX 77254. **North Texas Skeptics,** Joe Voelkering, President, P.O. Box 111794, Carrollton, TX 75011-1794. **West Texas Society to Advance Rational Thought,** Co-Chairmen: George Robertson, 4700 Polo Pky., Apt. 183, Midland, TX 79705-1542.

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(continued on next page)

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The Committee for the Scientific Investigation of Claims of the Paranormal

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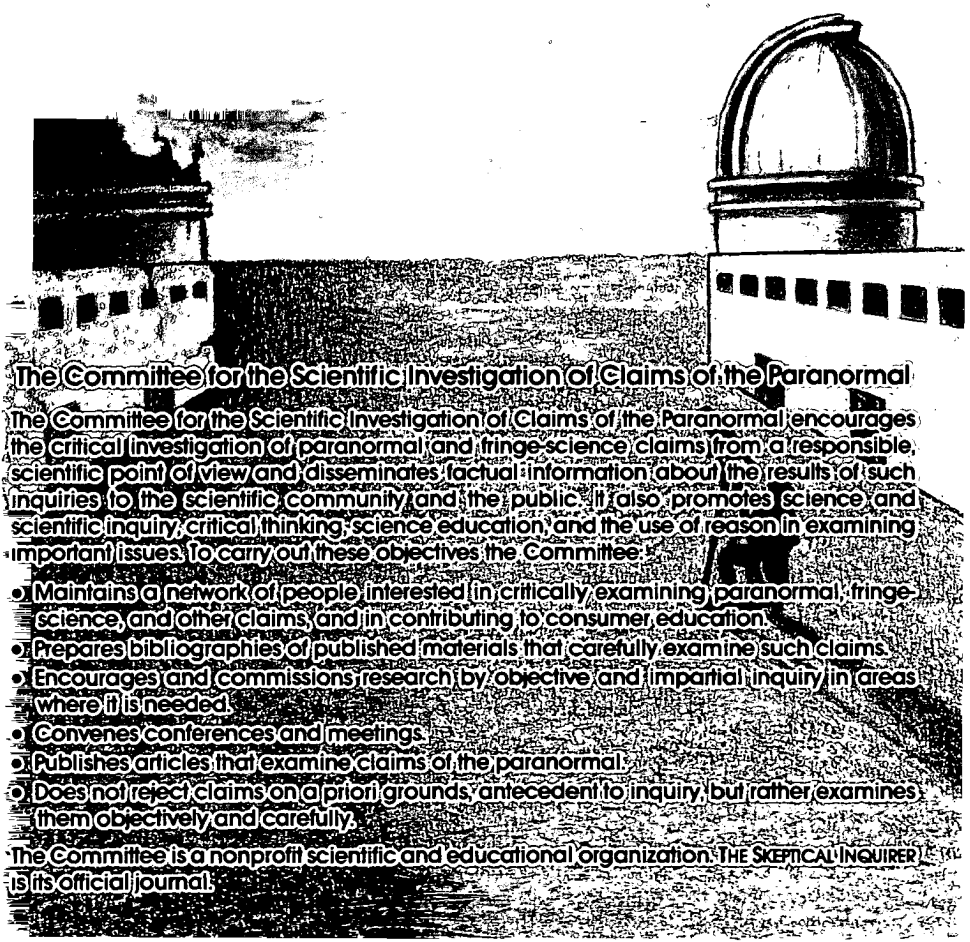
Paranormal Health Claims Subcommittee: Co-chairmen, William Jarvis, Professor of Health Promotion and Education, School of Public Health, Loma Linda University, Loma Linda, CA 93350, and Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105.

Parapsychology Subcommittee: Chairman, Ray Hyman, Psychology Dept., Univ. of Oregon, Eugene, OR 97402.

UFO Subcommittee: Chairman, Philip J. Klass, 404 "N" Street S.W., Washington, D.C. 20024.



The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining paranormal, fringe-science, and other claims, and in contributing to consumer education.
- Prepares bibliographies of published materials that carefully examine such claims.
- Encourages and commissions research by objective and impartial inquiry in areas where it is needed.
- Convenes conferences and meetings.
- Publishes articles that examine claims of the paranormal.
- Does not reject claims on a priori grounds, antecedent to inquiry, but rather examines them objectively and carefully.

The Committee is a nonprofit scientific and educational organization. THE SKEPTICAL INQUIRER is its official journal.